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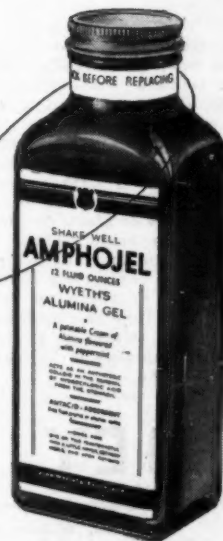
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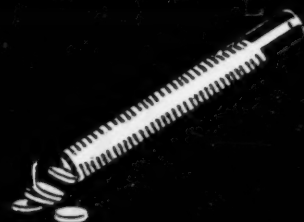
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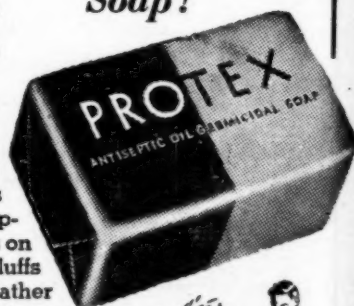
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### The Jackson Lecture.<sup>1</sup>

#### THE HISTORY OF APPENDICITIS IN AUSTRALIA: A WINDOW ON ABDOMINAL SURGERY.

By ALAN E. LEE,  
Brisbane.

IN this lecture, designed to honour the memory of Ernest Sandford Jackson, I propose to trace the rise in Australia of a surgical procedure which, as it almost exactly coincided with his professional life, he himself would have chronicled supremely well.

Removal of the vermiform appendix was not one of the earliest abdominal operations—rather, in point of fact, it came almost last. By 1884, which for reasons that will be apparent later I take as the starting point of this history, abdominal surgery was well established in Great Britain and on the continent, though in Australia single examples of such operations were still thought worthy of inclusion in the two Australian medical papers, *The Australian Medical Journal* and *The Australasian Medical Gazette*. The practice of general surgery, aided by the development of anaesthesia and of better knowledge of wound management, had made a considerable advance in the preceding forty years. In 1886 Sir Thomas Fitzgerald<sup>(1)</sup> wrote as follows:

In 1846, to be at all successful as an operator, certain qualifications were imperatively called for, which are not quite so absolutely necessary now.

Firstly, the surgeon had to be a man insensible to the infliction of pain, little sympathetic in his nature, and indifferent if not dead to the sufferings of others. Next, manual dexterity, though always a surgical requirement, was of much greater importance than it is at present. If the surgery was in the hands of a few,

the surgical procedures permissible were also extremely limited. In fact, operations were in reality almost wholly confined to those which had to be performed either to relieve agony or to prevent a painful death. In children, whose feelings were matters not to be consulted, some little latitude was allowed, and in this way tenotomy crept into practice.

These were the days when the speed of Liston, timed in seconds by multiple stop-watches, or of Maisonneuve, who amputated a thigh with a quick blow of a mallet and a swift cut, paid dividends, while it is little to be wondered at that a gallery of student onlookers should hiss even the great Syme for his fumbling slowness.

"The Surgery of 1860", wrote Fitzgerald, "was that of 1840, except that some of the operations were performed painlessly."

In Australia at any rate there was little further progress by 1880. Though Listerism was established about 1868, it had made but little impact on surgical practice here. Recalling in 1908 his student days at the Melbourne Hospital in the years from 1878 to 1881, George Adlington Syme,<sup>(2)</sup> Jackson's distinguished classmate, wrote as follows:

The first case that presented itself was an old burn, dressed with a linseed poultice. The smell from it was indeed bad, and was easily understood when the poultice was removed, and the dresser calmly, and as a matter of course, proceeded to remove with forceps the numerous maggots crawling over the foul discharging surface. Of the 345 operations performed in those four years, 45 were major amputations. Amputation for compound fractures was still the general rule. Abdominal operations in those days were rare and great events. Of twenty-six consultations held for abdominal conditions, in only nine was operation performed. The conditions regarded as inoperable included fibromyoma of the uterus, movable kidney, and cases vaguely diagnosed as malignant. Of the nine cases operated on, eight were ovarian cysts, and one though so diagnosed proved to be a hydatid. Of these operations three died. As a contrast in 1904-8 at the Melbourne Hospital, 863 operations were performed for appendicitis alone.

<sup>1</sup> Delivered at a meeting of the Queensland Branch of the British Medical Association on September 1, 1944.



Though the surgical wards of the leading hospital in the greatest and wealthiest city in the southern hemisphere contained at that time so few examples of abdominal surgery, such was also the experience of other general hospitals.

Ovariectomy, in the history of which the whole of the early development of abdominal surgery is implicit, owed nothing to Listerism, nothing to the general surgeon, and little to the general hospital. Its development was the work of a small group of gynaecologists. Though regarded by Liston in 1846 from contemporary experience as an "unjustified piece of butchery", its development through Clay in Manchester, through Lawson Tait in Birmingham, and through Baker Brown and Spencer Wells in London, was such that in 1884 both Tait and Wells were able to review their first 1,000 cases of abdominal section. "Just as this is written", states Lawson Tait in his text-book on "Diseases of the Ovary", "I have completed a series of 100 cases performed without any of Mr. Lister's so-called antiseptic processes. Only two of these hundred cases have proved fatal, and in both death was due to the fact that they had been repeatedly tapped." His first 1,000 cases included ovariectomy, salpingectomy, hysterectomy, cholecystotomy, nephrectomy and nephrotomy, but as yet no example of an operation on the intestines, nor any reference to diseases of the appendix.

Though their experience was so great, the surgery of these gynaecologists is not germane to the history of appendicitis, which was entirely developed by general surgeons, and of the fascinating story of their technical advances, their quarrels and their foibles little can be told tonight.

The earliest stirrings of a wider extension of abdominal surgery were, however, visible on the continent. Billroth performed his first successful resection of the pylorus for cancer in 1881, and between 1878 and 1883 he performed a large number of intestinal resections. Gastro-enterostomy was performed by Wölfler in 1881, the rectum was excised for cancer by Volkmann in 1878, and cholecystectomy was performed by Langenbuch in 1882.

But in Australia most of these surgical excursions remained for the future. There had certainly been some abdominal surgery prior to 1884. While the main operation was ovariectomy, performed by various techniques and with moderate success (greater in the hands of the gynaecologists than in those of the general surgeons), removal of the normal ovaries for nervous conditions was being increasingly performed. The resection of strangulated gut due to hernial obstruction or abdominal trauma was beginning to be practised, and during 1883 Fitzgerald recorded four fatal cases and Girdlestone one, though the evidence of bowel union found at autopsy gave more promise for the future. Hydatid disease, of extraordinarily high incidence in Victoria and South Australia, was also being attacked wherever it was found, and an occasional case of abdominal or liver hydatid cysts came to surgery.

#### Perforation of the Appendix Recorded in Australia.

These incursions of the surgeon into any part of the abdominal cavity other than the pelvis were, however, essentially a gloomy business. Sepsis, peritonitis and carbolic poisoning were the chief bugbears. In 1884, however, there appeared an article by J. Holden Webb<sup>(2)</sup> which marks the beginning of the history of appendicitis in Australia. This gentleman, then surgeon to the Melbourne Hospital, describing three cases of perforation of the vermiform appendix, wrote as follows:

The obscurity which envelops inflammatory implications of this strange analogue, for analogue I suppose it to be, is well known, and my cases were no exception. In fact so difficult did we find it to interpret the different symptoms as they arose and explain the absence of signs we expected, that it is no breach of confidence to confess that all three of my hapless patients expired without their malady having been accurately diagnosed either by the consultants or myself.

Instances of obstruction and inflammatory interference with the appendix are doubtless not very rare, at any rate not sufficiently so to be interesting from their novelty alone.

I certainly would advise abdominal section, and if I ever have another case go through my hands I shall open the abdomen, say "Nay" who will. The operation will at least give a chance.

In the case of a localized abscess, Webb said that he would advocate right lumbar drainage, even though it might appear "heroic and fantastic surgery". There is no documentary evidence that another case ever did arise.

Within the next few months, however, Mr. Webb's difficulties might have been lessened, for in the same year there appeared in the British journals two epoch-making articles. In Thomas Bryant's<sup>(3)</sup> Harveian lectures, "On the Differential Diagnosis of Acute Intestinal Obstruction and Typhilitis", the lecturer distinguished clearly between peritonitis, the result of typhilitis, and intestinal strangulation, though he did not suggest the possibility of diagnosis and treatment before perforation of the appendix occurs. This is what he says:

"A perforating ulcer", wrote my lamented friend, Hilton Fagge, "of any part of the direct channel of the alimentary canal is commonly fatal in a few hours, or in a day or two at the latest." Hence I believe that when peritonitis runs a more protracted course than this, there is a very strong presumption that it started from the caecal appendix. In fact, in the majority of cases recorded a diagnosis, or rather probable diagnosis, was possible on a careful examination of the facts of the cases, and more particularly of their histories. Indeed, in these cases, as in so many others, a careful history of the case is essential to enable the surgeon to form a definite diagnosis. The estimation of present symptoms alone is almost certain to mislead, whereas an estimation of all the facts of the case is absolutely necessary to guide.

With what slowness these wise words percolated through the medical profession is written in the later history of appendicectomy, with the absurd importance paid to the sign of tenderness, right up to the present day. To the contemporary surgeon, whose range of experience embodied only those visible and palpable abnormalities external to the body cavities, they might have opened a vista of new surgical hopes and horizons.

Of equal importance were the words of a great London physician, of whom Howard Kelly, the historian of appendicitis, wrote that they marked the end of the pre-celiotomy era of appendicitis.

In a clinical lecture, "On Cases of Difficult Diagnosis", Samuel Fenwick,<sup>(4)</sup> physician to the London Hospital, wrote as follows:

I would first invite your attention to a disease of rare occurrence, which has only of late years attracted the attention of practitioners, and which often presents considerable difficulty in diagnosis, viz., perforation of the vermiform appendix. From the fact of five cases of this kind having been admitted to the London Hospital within the past twelve months, you might infer that perforation of the appendix is by no means uncommon, but such is certainly not the case. An examination of the post-mortem records of the London Hospital during the past 40 years shows only 19 cases in which the appendix was in a diseased condition. It is quite certain, however, that the number cannot truly represent all those who have died in the hospital during so long a period of this disorder, for in the earlier volumes only one or two cases are recorded. In the earlier cases of perforation of the appendix placed on record venesection seems to have been generally trusted to as the only means of a cure, under the impression that the disease was of a purely inflammatory character. Its only effect was to lower the vital powers of the patient and thus diminish his chance of recovery by adhesion of the injured part to some of the neighbouring organs.

Other cases were treated by the use of drastic purgatives, but proved to be so detrimental that they were entirely abandoned in this as in other forms of peritonitis. Of late years, opium has been employed, but in no single case has it appeared to avert the fatal termination.

Theoretically it would seem much better if we could cut down upon the appendix as soon as the diagnosis is tolerably certain, tie it above the seat of the perforation, and remove from its neighbourhood any concretion or decomposing material that might be the cause of irritation.



The office of the physician therefore will most likely become restricted to diagnosis, and it is only by carefully watching the first symptoms and the physical signs of the disease and by comparing them with those of other disorders that may simulate it, that we shall be able to arrive at such correct judgement, as may justify the employment of surgical measures at an early period of the case.

This was written in 1884, and though it should now have been clear to all who read their journals that in perforation of the vermiform appendix lay the explanation of some cases of peritonitis and of intraabdominal abscess, it bore little fruit in treatment. Nine years were still to elapse before the first appendix was removed in Australia.

#### The Development of Abdominal Surgery.

The surgeons of that time found other interests. There was Lister's daring new operation of wiring the fractured patella and Professor Kocher's work on thyroidectomy. Though the advocates of iodine therapy still made out a good case for medical treatment, instances of successful thyroidectomy were published in Melbourne and Sydney. The discovery of cocaine and its rapid acceptance into the surgical specialties of dentistry and ophthalmology must have proved a boon little inferior to the earlier introduction of general anaesthesia; while the death of Sir Erasmus Wilson and his bequest of the major part of his fortune of £344,000 to the Royal College of Surgeons of England showed the possibilities inherent in dermatology before the days of income tax.

An instance of Alexander's operation on the round ligaments presaged that spate of operative gynaecology which rose to full flood ten years later. This was still the era of diagnosis by the sound, and of pessaries, meriting the rebuke of Clifford Allbutt that many gynaecologists, finding in their patient that "her uterus, like her nose, is a little on one side, or like that organ, is running a little", conclude that all the mischief originates in the sexual organs, so that "the unhappy viscus is impaled upon a stem, or perched on a prop, or is painted with carbolic acid every week in the year". The radical cure of inguinal hernia also became established.

In January, 1887, the first successful operation in Australia for ectopic gestation was performed at the Women's Hospital, Melbourne. In the same year, while discussing a successful operation for intussusception in an infant, J. P. Ryan could refer to the great extension of the use of laparotomy in recent years, both as an exploratory and as a curative measure. He remarked that the danger attending the operation had been largely removed by the delicacy with which it was performed and by the precautions which were taken by special antiseptic measures or by cleanliness.

Even apart from the surgical treatment of appendicitis, emergency abdominal surgery was curiously slow in developing. Well into the nineties there was still no record in Melbourne of the surgical treatment of a perforated peptic ulcer having any other result than medical treatment. For years to come, however, there was no disposition to follow the advice of Samuel Fenwick. Rather there still remained a period of pathological inquiry into the causes of general peritonitis before the turn of the surgeon was to come. In Melbourne, month after month, at the meetings of the Medical Society, Professor Allen, at first alone and later in association with Dr. Mollison, imparted to his audience that pathological knowledge on which the eminence of the Melbourne surgical school was to be built.

But overseas there was some progress. Even before 1884 there were records of abdominal abscesses having been incised and their contents evacuated; but that some of them were related to perforation of the appendix was only incidental.

A period of more active surgical intervention was, however, approaching. In 1884 Krönlein performed a laparotomy in a case of suppurative peritonitis, and purposively removed a gangrenous appendix; but the patient died three days later. In 1885, Mahomet, of Guy's Hospital, London, recognizing the importance of the faecolith in the aetiology of obstructive appendicitis, persuaded the surgeon, Charters Symonds, to open an

appendix in an abscess cavity and remove the faecolith. In May, 1886, R. J. Hall, of New York, at the Roosevelt Hospital, performed the first operation on the appendix in the United States of America. Cutting down on what he thought to be a strangulated inguinal hernia, he removed a perforated gangrenous appendix from within the sac near the bottom of the scrotum. This patient recovered. Frederick Treves, of London, whose authority in the surgery of the appendix was to be so great, in February, 1887, during an interval between attacks of appendicitis, explored the patient's abdomen, but was able to correct the distortion of the appendix without removing it. On April 27, 1887, Thomas G. Morton, of Philadelphia, performed the first successful operation for removal of the appendix, deliberately undertaken with an alternative diagnosis of disease in that organ. In a case of perforative peritonitis he removed the appendix, washed out the abdominal cavity and drained the pelvis; the patient recovered.

So far, however, treatment remained entirely limited to perforative appendicitis; in other words, the diagnosis was not made unless spreading peritonitis or localized abscess was evident. Already in 1886 Reginald Fitz,<sup>(6)</sup> of Boston, had summarized the knowledge then existing in the following clear statements:

1. The vital importance of early recognition of perforative peritonitis is unmistakable.
2. Its diagnosis in most cases is comparatively easy.
3. Its eventual treatment by laparotomy is generally indispensable.
4. Urgent symptoms demand immediate exposure of the perforated appendix after the recovery from shock and its after-treatment according to surgical principles.
5. If delay seems warranted the resulting abscess, as a rule intraperitoneal, should be incised as soon as it becomes evident, which is usually on the third day after the appearance of the character and the symptoms of the disease.

Practice in America veered quickly towards early surgical treatment of the disease, even before peritonitis was well established. Writing in 1889, McBurney<sup>(7)</sup> made the following statement:

How many cases of localized peritonitis or perityphlitis arise from impaction of faeces in the caecum? Is there a single observation brought from the dead-house or from the operating table to support this idea? I hope that never again may I go every day to visit a threatening case, waiting bashfully for the authority of a clearly defined peritonitis before I dare take action.

Though such a position was soon accepted in America, there still ensued in England a battle-royal between the advocates of early operation (after perforation), late operation and medical treatment. In February, 1888, Frederick Treves<sup>(8)</sup> read a paper in which he advised the treatment of selected cases of relapsing typhlitis by the deliberate removal of the offending appendix during a quiescent period; he quoted one case report. In the discussion that followed, Howard Marsh remarked that if, as he understood, Mr. Treves had found an appendix not perforated, he doubted whether he himself would have operated. He had made oblique incisions to look at the caecum, and had washed out faecal and other abscesses, but he had not amputated an appendix. Hare, though admitting that it was hardly his province to speak on a surgical subject, remarked with some emphasis that he had never found any need for surgical interference in his own cases of typhlitis or perityphlitis. He advocated the free use of leeches to the part, and was frequently surprised to find such a sure source of relief neglected nowadays. A little later in the discussion Knowsley Thornton,<sup>(9)</sup> perhaps in answer to Marsh's dubious attitude towards amputation of the appendix, made the surprising statement that he had often seen Sir Spencer Wells ligate and cut away the appendix, and he had never seen any ill results follow. Perhaps the great gynaecologist had regarded the appendix as statistically beneath his notice, for in his tabulation of 1,000 laparotomies it had received no mention.

This London discussion about represented the position in Australia up to 1893. Gardner, of Adelaide, in his presidential address at the Intercolonial Medical Congress in that year, spoke of the developing surgery of the appendix; but Syme,<sup>(10)</sup> with unrivalled surgical oppor-

tunity, in notes on twenty consecutive cases of abdominal surgery, could list only one case of appendicitis (with general peritonitis treated by drainage), and he made the following statement in this regard:

The more I see and read about this disease, the more difficult does it become to make up one's mind in individual cases. I still believe early operation in severe cases to be the safest treatment, but I am bound to state that I have seen several cases where operation seemed to me advisable, which have recovered under purely medical treatment.

It was still the peritonitis due to the appendiceal perforation which was being treated, as was well put by the gynaecologist, Balls-Headley, in the discussion on this paper, when he said that in appendicitis it was most difficult to know how much irritating matter had passed into the peritoneum, and therefore how necessary immediate abdominal section might be.

#### The First Deliberate Appendicectomy in Australia.

As far as my search of the Australian medical literature reveals, the first deliberate appendicectomy in this continent was performed by H. Russell Nolan,<sup>(1)</sup> surgeon to the Toowoomba Hospital, Queensland, as reported in *The Australasian Medical Gazette* of July 13, 1893. This report was as follows:

On the afternoon of the 10th March I was called to see Mrs. W., and found her complaining of great abdominal pain; she was vomiting persistently.

For some few days previously she had suffered from pain in the back, but had continued to perform her household duties. During the previous evening, the 9th, the pain in the stomach was first complained of, and then the vomiting began. The bowels acted twice, and then a dose of castor oil was taken, but after that there was no result, nor had any flatus passed, but the vomiting had increased in frequency and the pain became more intense up to the time of my visit.

She was 30 years of age, and the mother of four children. The previous health had been good, with no attack like this before, and menstruation had occurred three weeks ago. Hot applications were ordered, and morphia prescribed.

Late that evening I found her in all the throes of acute peritonitis, with quick pulse, rising temperature, dry skin, and thoracic respiration. Her face wore a very anxious expression, with sunken eyes and pinched nose. The vomiting was continuous; no flatus had been passed; the abdomen was somewhat distended and rigid, especially over its lower half, and acutely tender. After consultation with Dr. E. Roberts it was decided to operate early next morning.

At 8.30 on the following morning she was seen by Dr. Roberts, Dr. Falkner, Dr. Garde and myself, and it was then suggested to pass a stomach tube up the rectum. This was attempted, but such pain was produced that it was abandoned; a tender bulging mass was felt high up, to the right of the uterus. Her condition after this became very critical, and for a time she was in a state of collapse.

Operation was delayed for a few hours, and then chloroform was administered by Dr. Falkner, and with the assistance of Drs. Roberts and Garde, I opened the abdomen in the middle line. Some dark fluid, offensive but not faecal in odour, exuded. The presenting intestine was drawn out and examined carefully. It proved to be the jejunum and duodenum, and was examined up to the pylorus. Beyond being intensely injected and adherent in parts, it was normal. This was returned and the ileum extracted. This was of a much darker hue, being purplish in places, and the adjacent folds closely adherent to each other, and marked here and there with large plaques of yellow lymph.

The cause of the trouble soon appeared in the shape of an appendix, the seat of inflammation and perforation. Dark, stinking, thick fluid exuded from two perforations about one inch from its distal end. The appendix was detached, ligatured and removed. The uterus and the ovaries were normal. The cavity was irrigated with hot water, carefully dried, and a perforated glass drainage tube left in the lower end of the incision, which was united with silk ligatures.

The subsequent history of the case presented nothing worthy of remark, except that there was much flatulence during the first week, and the track of the tube discharged for some weeks.

On slitting up the portion removed, a small faecal concretion was found at the distal end, about the size of a No. 3 shot grain.

The patient is alive today as the result of a prompt operation, my only regret being that, seeing the urgency of the symptoms, even a few hours were lost from trying a useless and, as it happened, a dangerous expedient.

The gratification of Dr. Nolan would be greater if he could know, not only that his patient survived the operation for some months, but that she is still living and in good health fifty-one years after its performance. The secretary of the Toowoomba Hospital Board was intensely interested to know that his hospital was concerned with this phase of surgical history, and has succeeded in communicating not only with the patient herself, but also with Miss Ella Tolmie, the nurse from the Toowoomba Hospital who assisted Dr. Nolan on this occasion.

Dr. Nolan at this time had recently relinquished his resident appointment at the Toowoomba Hospital, to which he had gone immediately after his graduation in Sydney. Since the first ovariectomy in Toowoomba was not reported till some months after this report, it is probable that this might well have been his first personal experience in abdominal surgery. He continued in private practice till 1898, went to the Boer War with a Queensland mounted regiment, contracted typhoid fever in South Africa, and then proceeded to Europe for two years' post-graduate study. Returning to Australia, he commenced practice in Sydney in the specialty of oto-rhinology, and prior to his death there in 1915 was senior ear, nose and throat surgeon to Prince Alfred Hospital and lecturer in his specialty at the University of Sydney.

The operation just described was not performed at a general hospital, but on the kitchen table placed in the bedroom at the patient's home. Her own memory of the event is mainly of "a lot of boiling water, a lot of carbolic, and a lot of fuss". By the end of 1894 Dr. Nolan<sup>(2)</sup> was able to publish three further cases of abdominal section for peritonitis due to trouble in the vermiform appendix. The first case was one of intestinal obstruction due to strangulation of a loop of small intestine by a small, strong band in the region of the ileo-caecal valve. The band was divided and the patient recovered. In relation to this case Dr. Nolan makes the following statement: "I had seen him some months previously for an inflammatory swelling in the right iliac region (appendicitis?), which trouble subsided with rest and opiates. The moral of this case is, I think, the urgency of early operation." The second case was one of drainage of an abscess resulting from an appendicitis of two weeks' duration. Floating in the pus was a faecal concretion of the size and shape of a bean seed. This patient survived his operation for forty-five years. In the third case operation was performed in 1894 for appendicitis of three days' duration. The sloughing appendix was removed, the pelvis was drained by a glass tube, and the remainder of the incision was sewn up with silkworm gut. This patient also recovered.

#### The Second Published Case of Appendicitis in Australia.

Though the credit for the first published example of appendicectomy in Australia must belong to Russell Nolan, the second published case, that of G. A. Syme,<sup>(3)</sup> is possibly more significant, as representing the practice of a great metropolitan surgeon and teacher who in future years was to influence profoundly the Australian attitude towards this disease. In *The Australian Medical Journal* of March 15, 1894, Syme was able to publish two cases of appendicectomy with recovery. In the first of these cases, on August 29, 1893—one of severe septic peritonitis—he ligated and removed a gangrenous appendix, oversewed a secondary perforation in the caecum and drained the pelvis. This patient recovered. The second case (January 15, 1894) was of appendicitis of three weeks' duration; Syme opened the abscess cavity, ligated and removed the appendix and packed the cavity with iodoform gauze; this patient also recovered. In discussing these two cases, Syme made the following remarks:



That a large proportion of cases of appendicitis seen in practice belong to the simple catarrhal form and may be treated medically, must be fully admitted, and the practice of the American surgeons who operate in every case of appendicitis is to be condemned, but I hold very strongly that every case requires careful watching. Indications for operation may arise at any moment.

Syme believed that it was the effect of the septic condition on the general condition of the patient rather than the character of the local symptoms that must be the main guide to operation.

In the discussion that followed this communication, Gardner remarked that in relapsing appendicitis the question arose whether the appendix should be removed during the attack or during the intervals between attacks. His experience was that removal during the interval was followed by the greater success. Though this statement of Gardner's might be supposed to indicate that he had had considerable experience of appendicectomy prior to this date, there is no published evidence to warrant this conclusion, and it may be surmised that the cerebral condition which had driven him a year or two earlier to desert Adelaide for the greater metropolis of Melbourne, and which three years later was to cause his death, might have clouded his opinions.

#### Recurring Appendicitis.

In 1895, Hinder,<sup>(14)</sup> of Sydney, marked another milestone in the history of appendicitis, when, amongst fifty cases of abdominal section, he included two cases of frequently recurring appendicitis, with removal of the appendix in the interval, and recovery. This is a real milestone. All previous operations in Australia, whether for drainage alone, for drainage and irrigation, or for either combined with appendicectomy, had been operations primarily for peritonitis, diffuse or localized. Here for the first time the appendix was removed, not for the consequences of its perforation, but for the cure of the disease itself. Such a practice, of course, was a reflection of overseas experience, as was well stated later in the same year by W. A. Giles,<sup>(15)</sup> of Sydney:

My experience in dealing surgically with appendicitis is limited, as in only two instances have I found it necessary to operate, but many cases have come under my observation which yielded readily to simple remedies, and others, though admitted to my ward for operation, have recovered perfectly without surgical interference.

Giles continues:

The question of when we shall operate is still debatable, and has led to a variety of strongly expressed opinions by many experienced surgeons, and one section of the American school maintain that in every case of appendicitis, the process should be removed. With regard to recurrent cases, Dr. Dennis, of New York, believes it is not wise to operate during the interval, as the patient may never again be endangered by the disease, but if surgical interference is decided upon the second or third day of the attack should be chosen. But Mr. Frederick Treves states emphatically that the less interference the better during the inflammatory stage, while he has operated on a large number of patients during the interval without having a single death to record. The following rules have been laid down by Treves as a guide in chronic relapsing cases.

Operation is indicated when (i) the attacks have been very numerous; (ii) or are increasing in frequency and severity; (iii) or the last attack has been so severe as to endanger life; (iv) or the constant relapses have made the patient a chronic invalid; (v) or a persistent abscess is suspected.

The authority of Treves,<sup>(16)</sup> soon to become so massive in the treatment of this condition, dated from his paper, "Relapsing Typhlitis Treated by Operation". Recalling this in 1892, he wrote as follows:

The paper was read in February, 1888. I advised the treatment of selected cases of relapsing typhlitis by the deliberate removal of the offending appendix during a quiescent period. The proposal was not well received. In due course, however, an exuberant reaction took place, and of late appendices have been removed with a needless and illogical recklessness which has brought this little branch of surgery into well-merited disrepute.

Treves's advice was interesting, with its implications that surgical treatment in appendicitis was not a matter of

necessity to save life, but rather a matter of expediency to limit disability. Its advocacy of treatment and therefore often of diagnosis, at a time when the patient was well, must have made for considerable diagnostic uncertainty, which must easily have widened the indications, so that from this advice was born that swarm of needless operations which has scarcely ceased at this present day.

Indeed, these years at the latter end of the century were not conducive to the maintenance of rigid surgical standards. As Stewart McKay once quoted, "antiseptics did not win its spurs in the peritoneal cavity", and the general introduction to Australia of steam sterilization, originated by von Bergman in 1886, for the first time robbed abdominal surgery of its previously ever-present danger of peritonitis, or alternatively of fatal carbolic poisoning. The collapse of the great land boom in 1893 left many medical practitioners impoverished; and it is scarcely a matter for wonder that since abdominal section ranked in the official fee scale at from 30 to 100 guineas, there should have ensued a wide dissemination of operating amongst practitioners in general. The indications seemed endless. The introduction of methods of radical cure of inguinal hernia by MacEwen in 1887, and by Halsted and Bassini in 1889, offered a means of relief to all the sufferers from hernia then living (for prior to this operation had been limited to the relief of strangulation, without any attempt at removal of the sac). The scope of operative gynaecology became immense. Apart from its more legitimate activities, weird but frequent syndromes were attached to prolapse of the ovaries, and alleged to be cured by their removal. Removal of the ovaries was also practised extensively for neurotic symptoms, leading Dunbar Hooper as early as 1894 to protest that "double oophorectomy as a supposed remedy for neurosis, for hysteria and for the many abnormal mental peculiarities exhibited by girls, has brought the gynaecological side of our profession into great and deserved disrepute". And in 1900 Roger Cope could still write: "To some men the cutting out of ovaries is as simple as the gathering of flowers, and each vies with the other in his endeavours to fill his specimen jar first, or establish a new record by beating an old one."

While there were still no orthopaedists, backache in women began to assume a purely surgical aspect. Removal of the coccyx, ventrosuspension of the uterus, and fixation of the movable kidney were regarded as the chief mainstays in its cure. And yet other surgical fields were opening up. During 1898, in his presidential address to the Queensland Medical Society, Alexander Francis wrote as follows:

In seeking a subject on which to speak tonight, my chief object was to find one that had a general interest and at the same time one of which I had some slight personal experience. Strange as it may seem, I know of none that so thoroughly fulfills these conditions as Adenoid Vegetations. The more experience I get of them, the more strongly do I feel that no single affection in the whole domain of medicine and surgery has so far-reaching and general effect on the public health—nay, on the development of a nation—as these innocent little over-growths.

Francis advocated their surgical removal, and thought that about one child in ten did not have adenoid vegetations.

#### Australian Statistics of Appendicitis.

Though this great diffusion of surgical practice was occurring, and though one may suspect that many appendices were being removed, the leading surgical centres of Australia were curiously slow in accumulating impressive statistics of the surgical treatment of acute appendicitis. At the Melbourne Hospital, R. A. Stirling, in 1898, reviewing his past six months' surgery, could record 104 operations with three deaths, but only one case of suppurative appendicitis. G. A. Syme in the same year recorded a total experience of appendicectomy of forty cases with ten deaths. His co-surgeon, Fred Bird, had the fortunate experience of fifty cases with two deaths. In Sydney, in 1899, Charles P. B. Clubbe<sup>(17)</sup> collected records of 347 cases of appendicitis treated at the Prince Alfred Hospital and Sydney Hospital during the preceding six years. Their analysis is illuminating: 205 cases of per-



typhlitis were treated medically with no deaths; 59 "interval appendicectomies" were performed with six deaths; three appendices were removed during the attack, with no deaths; in 35 cases of appendical abscess eight deaths occurred; in 45 cases of general peritonitis 43 deaths occurred; of this last group, 29 patients were treated by removal of the appendix, flushing out of the peritoneal cavity, and drainage—27 died, and in sixteen cases there was no operation—the cause was discovered at the post-mortem examination.

In commenting on these results, Clubbe held that in cases of simple appendicitis we should do well to follow the old rule and not interfere during the attack. But it was our bounden duty to advise the patient to have the appendix removed during the quiescent stage. In suppurative appendicitis, it was not wise to seek the appendix, unless it obtruded itself before one.

In the following year Hinder,<sup>(10)</sup> of Sydney, could quote a personal record of 39 cases with six deaths, which did not yet include removal of a non-perforated appendix during an attack. But he quoted with approval the following statement of Mayo-Robson:

In America most surgeons are clear and outspoken in their belief that appendices should be removed even on suspicion. In England more caution holds, but it is doubtful whether true wisdom and real caution do not abide with the bolder policy.

Speaking in Brisbane in 1900, John Thomson stated that the records of the Brisbane Hospital could show only two cases of operation for appendicitis during the quiescent stage, and by implication none during the attack. By the kindness of the records department at that hospital I have had all the case histories between 1897 and 1902 examined, with the discovery of only two operations of any sort for appendicitis during that time, and these limited to drainage procedures. During this period a good many cases of appendicitis were listed, but the condition was evidently regarded as an almost exclusively medical ailment. Jackson was medical superintendent of the hospital till 1898, and after that visiting surgeon. Speaking of appendicitis in 1897, he remarked that the whole question of operation depended upon the amount of trouble the condition was causing. In those cases in which it had gone on to supuration, he had seen operation generally performed at a late period, in the way of an ordinary abscess, and he had seen but one fatal case.

Such, then, was the position at the turn of the century. A simple and a suppurative appendicitis were recognized. The patients with simple appendicitis were usually treated non-surgically and sometimes advised to undergo appendicectomy in the interval; the patients with suppurative appendicitis, because it threatened life, tended to be treated surgically early after perforation, with results that seemed to compare badly with the reported opinions of earlier years in relation to medical treatment or incision late after perforation.

In the intervening forty years no unanimity has developed as to how the acute attack is best treated. Australian opinion mainly veered towards the American viewpoint, and most of us would agree with G. A. Syme,<sup>(11)</sup> when he said in 1908: "I am as convinced as I am of anything in the practice of surgery, that if every inflamed appendix were removed by a competent surgeon within twenty-four hours of the onset of the disease, the mortality would be practically nil."

This advocacy of the precocious operation, as it has been called, does not necessarily imply acceptance of the immediate operation. All that has been argued of recent years in relation to the immediate operation in acute cholecystitis applies in equal measure to acute appendicitis. While few of us would deny that operation in the acutely inflamed gall-bladder, if it could be performed within twenty-four hours of the onset of the disease, would carry few risks, would avoid many complications, and in fact could be opposed only as being often an unnecessary and too drastic treatment, the same cannot be said of routine immediate operation after admission to hospital, when it is known that this is on the average on the fifth day of the attack. Here, as in appendicitis, while the precocious operation is good surgery, the immediate operation may be reckless practice.

In appendicitis, unfortunately, the distinction between the early and the immediate operation was often not made, and I can recall clearly that twenty-five years ago patients, even though moribund on their admission to hospital, were submitted to operation on the grounds that this offered them the only chance of survival. Such a practice is still far from extinct; within recent years attempts have been made in the surgical journals to show that the immediate operation for appendicitis, at whatever stage of the disease it may be, can produce statistically satisfying results.

But in Australia there has been an increasing tendency to depart from this practice, and I am firmly with those who hold that after the passage of several days, and especially if evidence of abscess formation or of widespread peritonitis is present, non-surgical measures should be instituted. Though I do not think it is often accepted in Australia, English practice, armed with the authority of the leading student's text-book in the British Empire, has often adopted an exactly opposite view. Because the attack may subside with medical measures, "Rose and Carless' Manual of Surgery,"<sup>(12)</sup> till the most recent editions, has advocated non-surgical treatment in the first two days of the attack, but advises operation when a tendency to supuration manifests itself or if the disease fails to subside. Such a practice is a direct survival of the early English viewpoint, which advocated medical treatment during the attack or till perforation occurred, and appendicectomy preferably as an interval procedure.

In relation to the interval operation, no unanimity has developed as to whether the appendix should be removed after the first attack, but there is a considerable consensus of opinion in favour of removal after a second attack.

#### Other Aspects of Appendicitis.

But I wish to speak now of other aspects of so-called appendicitis. You will remember I spoke earlier of the difficulty of maintaining diagnostic standards in relation to patients examined between attacks during a period of well-being.

Treves, now Sir Frederick Treves,<sup>(13)</sup> after his successful delayed treatment of King Edward's appendiceal abscess, could report in 1902 having operated on 1,000 patients in the quiescent stage with two deaths, and stated that "the risk of operation in this stage is almost infinitesimal". He believed in operation after a first attack had subsided. From his experience he believed that "more heed should be taken of a condition which should be called chronic appendicitis—as seen in patients who have an abiding trouble in the right iliac fossa, but never an attack of appendicitis. These attacks are common enough; there is a sense of discomfort in the abdomen, a gnawing pain, a burning pain, a gripping pain, a feeling that there is something coming away there, a desire to support the back. These symptoms come under the proper heading of chronic appendicitis, and should be more fully recognized than they are now". The treatment of these syndromes by appendicectomy was embarked on enthusiastically by surgeon and general practitioner alike, and during the next ten years almost countless appendices must have been removed. The wave of operative zeal has now long passed, and ever-widening circles of the profession are becoming aware that such symptoms are not due to disease of the appendix and do not require surgical measures for their relief.

But even in these early years of the twentieth century, there were many other contenders for the privilege of treating these chronic abdominal wall neuralgias by surgical methods. The advocates of nephropexy were active, and argument waxed keen within their ranks whether every movable kidney should be fixed, or only such as caused symptoms, the symptoms, strange to say, being usually just those attributed by Treves to chronic appendicitis.

The believers in intestinal stasis were equally keen. Though their intrusions on the body physiology were mainly medical, there was yet some room for the surgeon, ranging from the relative innocuousness of C. B. Keetley's exteriorization of the appendix for the purpose of bowel lavage, to the masterpiece of that superb technician and high-priest of the cult, Arbuthnot Lane, the ablation of the intestinal cess-pool.

The commencing application of the Röntgen rays to the study of the alimentary tract also yielded a rich harvest. As in earlier years, the conscientious gynaecologist had thought it proper to force the position of all uteri into one common mould, so many of these pioneers in the use of the bismuth meal or clyster, worried by the colon's waywardness in shape, length or position, attempted heroically either by the cutting of congenital bands and adhesions, or by colopexy, to mould it to their desires. Need I add that the gynaecologist also claimed his share, and, explaining the right iliac syndrome as due to cysts or neuralgia of the ovary, to varicosities or to inflammation of the broad ligament, obtained by his surgery just the same mixture of brilliant cure, but frequent failure, as was obtained by every other form of surgical treatment.

Yet, had these narrow specialists, immersed in their immediate problems, taken time to read back to where we started this history, the reason for the uncertainty of their results would have been made plain, for in 1884 Clifford Allbutt,<sup>(21)</sup> in his lectures on the visceral neuroses, had written as follows:

Now if we turn our eyes upon the flock of women who lie under the wand of the gynaecologist, we shall find it so largely composed of the neurotic and the hysteric, that we may say in our haste the uterus has no substantial disease; that its affections are all neurotic, or so far reinforced by neurosis as to depend for their cure mainly upon neuropathic medicine. Herein we in our turn should be to blame. Many a woman, otherwise robust enough, and many a woman, whose weakness may lie not in her nervous system, suffers from uterine disorder. Making, however, the utmost allowance for all these, I contend that a vast number, I will go further and say a preponderating number of such sufferers, lie under the scourge of neurosis, and that their uterine and ovarian disorders are either wholly neurotic, or as I have said, so reinforced by neurosis as to depend chiefly or wholly upon general medicine for their relief.

If this were recognized, many of those now rendered hopeless invalids and allowed to drift into a state of moral and physical degradation by the manipulations and mental debasement of a narrow specialism would, by a more enlightened and vigorous régime, be restored to sound health.

With 1914 I must end this history, for we are reaching modern times, and its actors still walk upon the stage; but first there is one more development in association with appendicitis I must portray.

#### The Surgical Dyspepsias.

We have reached now the era of the so-called surgical dyspepsias. Moynihan, Murphy and Will Mayo were giants in the land; gall-stones and gastric and duodenal ulcers were commonly diagnosed, and their treatment was regarded as purely surgical, but, alas, at operation they were not so often found. The radiological examination of the gastro-intestinal tract was as yet in its infancy (some of Sir Alan Newton's and Sir H. B. Devine's earliest published work was in fact in relation to this subject), and every operation for a chronic abdominal syndrome was indeed an exploratory laparotomy; in the absence of the expected physical findings, appendicectomy was rarely omitted. Many of these patients became well, and it was but natural that, Allbutt being forgotten, a speculative diagnosis of appendiceal dyspepsia should be made. From this beginning, and in view of the handicap imposed by the defective theories of abdominal pain then current, it was natural that cases of chronic dyspepsia, associated with right iliac tenderness, should be regarded as of appendiceal origin. In 1910 Syme<sup>(22)</sup> remarks that "it came as a surprise to hear Mr. Moynihan state at his clinic in Leeds that practically all cases diagnosed as medical gastric ulcer by physicians were not gastric ulcer, but appendicitis, and that if the appendix was removed, the gastric symptoms were cured". Since Syme could also report that "Mr. Moynihan holds (and he is supported by some of the physicians) that once duodenal ulcer is recognized there remains only surgical interference", the high tide of operative surgery for dyspeptic symptoms had surely been reached. So common did such diagnosis

become that in 1910 Mitchell<sup>(23)</sup> was able to write as follows:

Appendicitis is by far the most common of abdominal lesions amongst us at the present moment, and we are almost daily brought into contact with patients who have suffered or are now suffering from this fashionable ailment. There are many persons who have obscure subacute abdominal attacks that can only be sheeted home to the appendix by most careful examination and observation. After operation, one hears over and over again from the patient that he was never so well in his life as he has been since the operation. Doubtless many factors contribute to this good result, and I do not want to strain a point. But I cannot overlook the fact that, after many years of digestive difficulties, the patients are now free from discomforts and disabilities, and that this freedom dates from the removal of the appendix.

But there were already doubters of the soundness of this form of reasoning. I was interested to note that in 1911 B. T. Zwar, later my surgical chief, remarked that all these so-called appendiceal dyspepsics seemed to be nervous individuals, while Rutherford Morrison<sup>(24)</sup> added this weighty warning:

It is never safe to promise, even after evidence of gross disease is found in the appendix, still less if a lesion has to be looked for with great care, that all the existing symptoms of ill-health will disappear as a result of the operation. The fact is that in the abdomen, as elsewhere, the results of speculative surgery are apt to lead to disappointment, and the brilliant cures occasionally effected do not always mean that the surgery has been good.

The greatest disadvantage is that nervous but useful people are not infrequently converted into useless invalids, a trouble to themselves and a sorrow to their relations and friends, by a useless operation, and it is time to say that there are now too many such victims of useless surgical activity in this field.

Need I say that appendiceal dyspepsia is now relegated to the limbo of history, where, with its relative, chronic appendicitis, may it rest in peace.

#### Conclusion.

And now to end this story, you have heard tonight how appendicitis gradually emerged from a position little regarded as a cause either of death or of disability and became within a quarter of a century the most fashionable of human ailments; how amputation of the vermiform appendix, starting so late in the chronology of abdominal surgery, became for a while incomparably its most frequent procedure, and yet was to decline so that in another thirty years its performance, save in emergency surgery, is rarely undertaken.

Truly the appendix was the shooting star of surgery.

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### CALCIUM, MAGNESIUM AND PHOSPHORUS IN THE MILK OF AUSTRALIAN WOMEN.

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The work reported in this paper was carried out with the object of determining the calcium, magnesium and phosphorus content of maternal milk in the Melbourne area. By a comparison of the results obtained with the figures given by Ritchie<sup>(1)</sup> for Canberra, it was hoped to obtain reliable information about the mineral content of breast milk in Australia. The existence of a low mineral level, if confirmed, might possibly be regarded as a factor contributing to the condition of dental caries so prevalent in this country.

The various results published by overseas workers have been drawn up in tables by Widdows *et alii*<sup>(2)</sup> and Holt,<sup>(3)</sup> in which milk collected during the period of lactation has been divided into (a) colostrum, (b) transition, (c) early and late mature milk, and (d) late milk. On the other hand, Ritchie's<sup>(1)</sup> tabulation has divided the period of lactation into (i) the colostrum period, (ii) the period from the end of the first to the beginning of the tenth month, and (iii) the period from the tenth month onwards.

It was decided in this investigation to follow the Canberra system, and to include (a) the colostrum period and (b) the rest of the lactation period, since only a few samples representing late milk (after the tenth month) could be obtained.

#### MATERIALS.

The samples of milk were obtained from normal mothers in the maternity ward of the Women's Hospital, and in the later stages of lactation, from women attending several baby health centres of the Victorian Baby Health Centres Association.

In the hospital ward the milk was collected between the fifth and tenth days after parturition from three consecutive feedings, 7 a.m., 11 a.m. and 3 p.m. The practice adopted was to empty the breast completely by means of an electric pump, and after collecting the sample, to give the remainder to the baby by bottle.

At the baby health centres the samples were collected in the same manner, but from one feeding only. Samples were taken at intervals of about one month, always at the same feeding time.

The milk was preserved by addition of one drop of formalin and kept in the refrigerator. Although it was found to keep well, even for a period of a few weeks, the analysis was commenced on the following day.

#### METHODS.

The milk was thoroughly mixed, 20 millilitres were pipetted into a platinum dish, 0.5 to 1.0 millilitre of concentrated nitric acid was added, and the mixture was

slowly evaporated to dryness on a sand bath over a micro burner. When completely dry the material was ignited and ashed in a muffle furnace and dissolved in 5.0 millilitres of boiling hydrochloric acid (10%). The solution was then transferred to a 20 millilitre measuring flask and diluted to the mark with distilled water. From this solution two separate portions were taken, one for calcium and magnesium estimations, and the other for phosphorus estimation.

The calcium content was determined by the method described by Hansman and Wilson<sup>(4)</sup> (based on Kramer and Tisdall's method), slightly modified to enable the magnesium estimation to be made on the supernatant liquid.

Five millilitres of the hydrochloric acid solution were pipetted into a centrifuge tube of a capacity of about 15 millilitres and 1.0 millilitre of saturated ammonium chloride solution was added, followed by 1.0 millilitre of oxalic acid (10%) and one drop of methyl red indicator (saturated alcoholic solution). Next, by means of a pipette drawn out to contain twenty drops per millilitre volume, 4 N ammonia was added drop by drop under constant stirring to pH 5. The number of drops of ammonia was counted. The stirring rod was then washed with distilled water, which was added to bring the total volume to 10 millilitres. The precipitated calcium oxalate was left for two hours and then centrifuged for fifteen minutes at 2,000 revolutions per minute.

The supernatant liquid was poured off carefully and kept for magnesium estimation. The calcium precipitate was washed with five millilitres of ammonia (2%) and left overnight. The rest of the procedure was as described by Hansman and Wilson. The titration was carried out in duplicate with N/20 potassium permanganate solution.

Magnesium was estimated as ammonium-magnesium phosphate (6 H<sub>2</sub>O). For the precipitation of magnesium, Godden and Duckworth's<sup>(5)</sup> modification of Denis's method was used and applied to milk as follows.

Into a conical centrifuge tube of 15 millilitre capacity, 1.0 millilitre of concentrated ammonia and 1.0 millilitre of 5% ammonium phosphate solution were measured, followed by 4.0 millilitres of supernatant liquid after the precipitation of calcium, corresponding to 2.0 millilitres of milk. The precipitate was left for two to three hours and centrifuged for fifteen minutes at 2,000 revolutions per minute. After draining, the precipitate was stirred by a fine stream of wash liquid (580 millilitres of alcohol [96%], 320 millilitres of distilled water, 100 millilitres of amyl alcohol and 30 millilitres of concentrated ammonia) and drained again. The tube was then filled with the wash liquid and left overnight. The decanting of supernatant liquid has to be executed with extreme care, otherwise serious errors may arise.

For the colorimetric determination, the original method of Fiske and Subbarow<sup>(6)</sup> was adapted. The dry precipitate of ammonium magnesium phosphate was dissolved in the centrifuge tubes by addition of 1.0 millilitre of 5 N sulphuric acid; 7.6 millilitres of distilled water, 1.0 millilitre of 2.5% ammonium molybdate solution and 0.4 millilitre of amino-naphthosulphonic acid solution were then added, which brought the total volume to 10 millilitres and the normality of the sulphuric acid to 0.5 N. The reading was done after five minutes, a separate standard of 5.0 millilitres of a solution containing 0.07 milligramme of magnesium (as ammonium-magnesium phosphate [6 H<sub>2</sub>O] in 0.01 N sulphuric acid) being used for every four or five samples in duplicates, as the blue colour developed has the tendency to deepen with time.

The phosphorus content was estimated by the Martland and Robison<sup>(7)</sup> method, two millilitres of the original hydrochloric acid solution being used for estimation. As standard, a solution of potassium dihydrogen phosphate was used containing 0.1 milligramme of phosphorus per millilitre. Three millilitres of standard were used.

#### EXPERIMENTAL INVESTIGATION.

##### Preliminary Experiments and Results.

According to Widdows *et alii*,<sup>(2)</sup> one woman may secrete milk with certain variations in mineral contents within a day, or from day to day. The between-feedings and day-to-day variations, however, are much greater for various subjects than in the case of any individual woman. Nims *et alii*<sup>(8)</sup> found that the magnitude of variations of



the milk constituents was greater within a day than from day to day, when twenty-four hour samples of mature milk were compared.

As the method of milk collection in this work varied greatly from the methods used by the above-mentioned workers, it was decided to make a number of investigations on the local material. Since during this investigation the milk samples were taken from one breast, it was considered desirable to check the procedure in a series of four patients by taking an average sample from both breasts at the same time. The reliability of the method applied can be inferred from the results given in Table I.

TABLE I.  
The Calcium, Magnesium and Phosphorus Content of Milk Taken from Both Breasts. (Milligrammes per 100 Millilitres.)

Donor.	Calcium Content.		Magnesium Content.		Phosphorus Content.	
	Left Breast.	Right Breast.	Left Breast.	Right Breast.	Left Breast.	Right Breast.
A .. ..	34.1	33.4	3.15	3.21	14.4	14.6
B .. ..	27.2	27.1	3.42	3.46	16.2	16.9
C .. ..	26.3	27.6	3.15	3.18	12.7	12.7
D .. ..	37.8	38.2	3.52	3.46	11.6	12.0

To investigate the variations between feedings in the course of one day, nine patients were studied, four *primiparae* and five *multiparae*. The milk samples were collected between the sixth and ninth days after parturition. The results are given in Tables II and III.

It appears that the differences in mineral content at different times within one day are considerable, largest for phosphorus and smallest for magnesium. As a whole, however, the individual variations were significantly less than those between different women. *Primiparae* and *multiparae* show the same range of fluctuations.

To study the day-to-day variations, eleven women were selected, six *primiparae* and five *multiparae*. Samples from five of them were taken daily, always at the same feeding time, for eight to ten consecutive days from the first day after parturition. Milk from the other six was examined on the seventh and ninth days. In both cases the total volume of milk excreted was measured. The results in Table IV show that during the first three or four days

TABLE II.  
The Calcium, Magnesium and Phosphorus Content of Milk at Different Feeding Times Within One Day. (Milligrammes per 100 Millilitres.)

Donor.	Feeding Time.	Parity.	Calcium Content.	Magnesium Content.	Phosphorus Content.
E	7 a.m.	First.	29.1	3.15	14.8
	11 a.m.		28.7	3.18	15.3
	3 p.m.		28.1	2.76	16.4
	7 p.m.		27.9	2.95	15.4
F	7 a.m.	Second.	25.0	3.06	14.9
	11 a.m.		24.4	2.83	15.8
	3 p.m.		24.8	2.70	14.6
	7 p.m.		25.0	2.80	15.8
G	7 a.m.	Sixth.	26.0	2.56	9.7
	11 a.m.		25.6	2.48	10.6
	3 p.m.		26.2	2.60	11.4
	7 p.m.		27.0	2.56	12.7

after parturition, the volume of milk and the level of all three minerals increased each day. After the fifth day, in most cases, it seemed to reach a certain level, and the subsequent fluctuations were much less pronounced. Sikes<sup>(1)</sup> found a maximum level for phosphorus between the seventh and ninth days and a subsequent fall. In the six cases examined, on the seventh and ninth days (Table III) the day-to-day differences for the corresponding feeding times were often smaller than the variations within one day at different times. Nims *et alii*<sup>(2)</sup> obtained the same results for mature milk.

No striking differences could be detected between *primiparae* and *multiparae*. No relationship could be shown between the amount of milk excreted and the mineral level.

Since the mature milk, according to various authors, shows a greater degree of consistency than milk secreted during the colostrum period, the differences which arise by the collection of the samples from one feeding only can be overlooked.

#### Main Investigation and Results.

##### Colostrum Period.

The colostrum milk of 212 normal mothers was examined for calcium and magnesium and that of 25 normal mothers for phosphorus. The individual figures obtained have not been tabulated, owing to the large number involved. The results were submitted to careful statistical analysis, which led to the following conclusions.

TABLE III.  
The Calcium, Magnesium and Phosphorus Content of Milk at Different Feeding Times on the Seventh and Ninth Days. (Milligrammes per 100 Millilitres.)

Donor.	Parity.	Feeding Time.	Calcium Content.		Magnesium Content.		Phosphorus Content.		Volume of Milk. (Millilitres.)	
			7th Day.	9th Day.	7th Day.	9th Day.	7th Day.	9th Day.	7th Day.	9th Day.
H	First.	7 a.m. ..	32.7	30.5	3.00	3.00	14.0	15.7	55	110
		11 a.m. ..	32.0	29.3	3.13	2.71	14.1	15.1	64	118
		3 p.m. ..	33.2	30.5	3.22	2.77	15.5	17.8	75	85
		7 p.m. ..	31.3	29.5	3.23	2.80	15.2	15.5	66	90
I	First.	7 a.m. ..	31.1	30.3	3.29	2.86	15.9	15.8	183	125
		11 a.m. ..	30.7	29.3	3.11	2.80	16.5	15.7	125	145
		3 p.m. ..	32.9	31.3	3.35	2.77	17.0	17.1	120	112
		7 p.m. ..	32.2	31.9	3.15	2.80	16.2	16.7	150	155
K	First.	7 a.m. ..	23.2	23.2	3.02	3.07	14.5	15.1	190	275
		11 a.m. ..	23.0	23.2	3.29	3.11	15.2	16.0	140	115
		3 p.m. ..	23.0	22.4	3.22	3.23	15.6	16.5	132	115
		7 p.m. ..	23.2	22.4	3.13	3.20	16.1	16.2	120	135
L	Fifth.	7 a.m. ..	25.4	23.2	2.95	2.89	17.6	16.2	125	140
		11 a.m. ..	24.8	22.2	2.75	2.55	17.9	17.1	120	120
		3 p.m. ..	21.8	21.4	2.64	2.47	16.8	16.6	95	90
		7 p.m. ..	20.8	20.4	2.50	2.57	16.2	16.3	85	80
M	Third.	7 a.m. ..	25.4	25.0	3.08	3.52	16.0	16.7	105	110
		11 a.m. ..	25.6	24.8	3.29	3.55	17.5	18.3	70	70
		3 p.m. ..	24.8	24.0	3.20	3.15	17.2	18.3	70	80
		7 p.m. ..	23.8	22.4	3.22	3.13	16.5	16.6	40	60
N	Second.	7 a.m. ..	32.3	30.3	3.41	4.05	15.7	15.0	70	75
		11 a.m. ..	32.9	29.9	3.35	3.96	16.7	16.6	75	70
		3 p.m. ..	32.5	29.5	3.41	3.72	16.4	16.5	55	80
		7 p.m. ..	30.5	29.3	3.10	3.64	16.3	15.9	48	50

TABLE IV.  
The Calcium, Magnesium and Phosphorus Content of Milk from the First to the Tenth Day after Parturition. (Milligrammes per 100 Millilitres.)

Donor.	Observation.	First Day.	Second Day.	Third Day.	Fourth Day.	Fifth Day.	Sixth Day.	Seventh Day.	Eighth Day.	Ninth Day.	Tenth Day.
O, First Parity.	Feeding time . . . .	11 a.m.	11 a.m.	11 a.m.	11 a.m.	11 a.m.	11 a.m.	11 a.m.	11 a.m.	11 a.m.	11 a.m.
	Volume of milk (millilitres) . . . .	10	24	38	67	52	75	70	65	125	80
	Calcium (milligrammes per 100 millilitres) . . . .	13.1	15.5	18.8	21.6	22.8	22.2	21.8	21.1	22.3	21.9
	Magnesium (milligrammes per 100 millilitres) . . . .	2.50	3.10	3.01	3.47	3.90	3.70	3.73	3.69	3.50	3.71
	Phosphorus (milligrammes per 100 millilitres) . . . .	10.2	11.5	12.8	15.4	16.8	15.9	15.7	16.1	15.9	16.3
P, First Parity.	Feeding time . . . .	11 a.m.	11 a.m.	11 a.m.	11 a.m.	11 a.m.	11 a.m.	11 a.m.	11 a.m.	11 a.m.	11 a.m.
	Volume of milk (millilitres) . . . .	8	15	48	85	80	120	186	210	160	—
	Calcium (milligrammes per 100 millilitres) . . . .	—	23.2	28.5	26.9	33.5	31.8	32.3	33.0	32.1	32.7
	Magnesium (milligrammes per 100 millilitres) . . . .	—	2.03	2.90	3.22	3.19	3.40	3.36	3.29	3.21	3.31
	Phosphorus (milligrammes per 100 millilitres) . . . .	—	12.7	13.2	13.1	13.5	14.3	13.8	14.7	13.5	14.2
R, First Parity.	Feeding time . . . .	7 p.m.	7 p.m.	7 p.m.	7 p.m.	7 p.m.	7 p.m.	7 p.m.	7 p.m.	7 p.m.	7 p.m.
	Volume of milk (millilitres) . . . .	12	26	218	283	293	301	214	—	—	—
	Calcium (milligrammes per 100 millilitres) . . . .	18.7	17.1	23.6	29.1	30.1	30.7	25.8	25.0	29.5	—
	Magnesium (milligrammes per 100 millilitres) . . . .	—	1.37	2.25	2.95	3.70	3.98	3.73	3.93	3.83	—
	Phosphorus (milligrammes per 100 millilitres) . . . .	10.4	10.3	13.8	15.2	18.1	18.1	14.8	13.9	18.0	—
S, Third Parity.	Feeding time . . . .	7 p.m.	3 p.m.	3 p.m.	3 p.m.	3 p.m.	3 p.m.	3 p.m.	3 p.m.	—	—
	Volume of milk (millilitres) . . . .	2	7	56	175	162	155	130	175	—	—
	Calcium (milligrammes per 100 millilitres) . . . .	—	14.6	18.1	17.9	21.5	22.8	22.6	21.4	—	—
	Magnesium (milligrammes per 100 millilitres) . . . .	—	3.70	4.43	4.42	4.84	5.21	4.92	4.67	—	—
	Phosphorus (milligrammes per 100 millilitres) . . . .	—	—	9.71	11.2	12.3	13.0	13.1	13.0	—	—
T, Second Parity.	Feeding time . . . .	10 a.m.	10 a.m.	10 a.m.	10 a.m.	10 a.m.	10 a.m.	10 a.m.	10 a.m.	10 a.m.	10 a.m.
	Volume of milk (millilitres) . . . .	3	46	57	76	94	92	100	100	80	94
	Calcium (milligrammes per 100 millilitres) . . . .	—	28.1	29.9	29.5	28.1	27.9	26.6	26.6	27.0	26.4
	Magnesium (milligrammes per 100 millilitres) . . . .	—	3.59	3.41	3.13	3.00	2.85	2.78	2.82	2.92	2.97
	Phosphorus (milligrammes per 100 millilitres) . . . .	—	14.5	17.6	18.3	17.2	18.2	16.8	17.0	16.9	16.9

A wide range of calcium, from 15 to 42 milligrammes per 100 millilitres of milk, was found (in a single case which was not tabulated the calcium content reached 56.3 milligrammes per 100 millilitres; the same milk had also a very high magnesium content). The mean value obtained was 28.2 milligrammes per 100 millilitres, the standard deviation being 5.90. The frequency distribution curve was tested for skewness, and the results obtained ( $g_1 = -0.076$ ,  $g_2 = -0.608$ ) indicate a normal curve.

The mean value appears to be rather low compared with that obtained by Widdows *et alii*<sup>(1)</sup> (33.3 milligrammes per centum, 101 cases), by Sikes<sup>(2)</sup> (30.1 milligrammes per centum, 45 cases), by Holt<sup>(3)</sup> (32.0 milligrammes per centum, 17 cases), and by De Lange<sup>4</sup> (32.0 milligrammes per centum, 18 cases); however, other authors, for example, Telfer<sup>(5)</sup> (28.4 milligrammes per centum, five cases), Nims<sup>(6)</sup> (26.6 milligrammes per centum, three cases), Soldner<sup>7</sup> (27.4 milligrammes per centum, six to eight cases), Schloss (23.9

milligrammes per centum, one case), and Barhardt and Edelstein (34.0 milligrammes per centum, four cases), give, in certain instances, even lower average results. Usually, however, such authors dealt with only a small number of cases, so that their results cannot be taken into consideration.

The range of magnesium content during the colostrum period was found to vary from two to five milligrammes per 100 millilitres (in a single case, in which the high calcium level previously mentioned was reached, the magnesium content was 5.73 milligrammes per 100 millilitres). The mean value for this period was 3.22 milligrammes per 100 millilitres, standard deviation 0.52. The frequency distribution curve was not investigated, as the range does not permit a sufficient number of classes.

Other workers have found the following mean magnesium values for the colostrum period: Holt,<sup>(3)</sup> 5.23 milligrammes per centum, 17 cases; De Lange,<sup>4</sup> 5.42 milligrammes per

centum, 23 cases; Soldner,<sup>1</sup> 3.91 milligrammes per centum, 14 cases, and 3.01 milligrammes per centum, several cases; Hasegawa,<sup>(2)</sup> 3.47 milligrammes per centum, four cases.

The average calcium:magnesium ratio was approximately 9:1, although a high calcium level in a sample of milk does not necessarily correspond with a high magnesium level, or *vice versa*.

The phosphorus values ranged from 10 milligrammes to 20 milligrammes per 100 millilitres. The mean value was 15.9 milligrammes per 100 millilitres. No statistical tests were applied, owing to the small number of samples investigated. The following values have been obtained by other workers: Holt,<sup>(3)</sup> 15.6 milligrammes per centum, 17 cases; Widdows *et alii*,<sup>(4)</sup> 15.9 milligrammes per centum, 14 cases; Sikes,<sup>(5)</sup> 13.0 milligrammes per centum, 45 cases; De Lange,<sup>1</sup> 25.3 milligrammes per centum, 23 cases; Telfer,<sup>(6)</sup> 20.9 milligrammes per centum, five cases; Soldner,<sup>1</sup> 13.7 milligrammes per centum, six to eight cases.

**Investigation of Milk from Abnormal Mothers.**—During the colostrum period, milk from eighteen mothers suffering from various conditions (altogether forty samples) was taken and compared with milk from normal mothers. The pathological conditions included albuminuria, post-partum hæmorrhage, eclampsia and prematurity. The milk was collected in the normal manner two or three times from each patient on different days from the third to the tenth day after parturition, but always at the same feeding time.

It can be assumed that, although the day-to-day variations were often more pronounced than in the case of normal mothers, the mean values were well within normal limits. The mean values for all forty samples were as follows: calcium, 27.8 milligrammes per 100 millilitres; magnesium, 3.13 milligrammes per 100 millilitres; phosphorus, 13.8 milligrammes per 100 millilitres. Only the phosphorus level seems to be slightly below normal. No specific differences could be detected in any one of the above-mentioned pathological conditions.

#### Mature Milk.

This part of the investigation covered the whole period from the third week till the end of lactation. The samples were taken at intervals of one month (calculated as lunar months) as long as the lactation proceeded. However, owing to the abnormal war conditions, many women weaned their children after a short time, or were evacuated to country districts where they could not be reached.

During the investigation 155 milk samples from 65 normal mothers were examined for their calcium, magnesium and phosphorus content. The results are given in Table V.

The calcium content of milk during the mature period was found to vary from 21 milligrammes to 44 milligrammes per 100 millilitres. The mean value for every month rose from the colostrum period through the first, second and third months, when it reached its peak and then gradually declined up to the eleventh month. In the few samples examined after the tenth month a rise was again found. Before they were combined the Melbourne

and Canberra results were tested statistically (*t* test for significance of means being applied) and no significant differences were found.

The combined Melbourne and Canberra results for calcium and phosphorus content were then statistically examined. The results are given in Table VI. The frequency distribution curves for calcium for each month appear to be normal. Tests for skewness were not applied, owing to an insufficient number of samples.

TABLE VI.  
The Calcium and Phosphorus Content of Milk from Australian Women According to the Month of Lactation. (Milligrammes per 100 Millilitres.)

Month of Lactation.	Number of Samples.	Calcium Content.		Phosphorus Content.	
		Mean.	Standard Deviation.	Mean.	Standard Deviation.
1	48	28.6	4.29	15.9	2.21
2	80	29.9	4.35	15.0	2.27
3	78	30.7	4.28	14.1	1.79
4	81	29.5	4.35	13.7	1.80
5	76	28.4	3.66	14.0	1.68
6	61	27.7	3.83	13.2	1.78
7	49	27.4	3.06	13.0	1.74
8	39	26.7	3.46	13.5	1.56
9	29	25.8	4.39	13.2	2.02
10	22	24.0	3.01	12.1	2.00
11	12	26.9	3.79	12.2	2.35

There are many references by overseas workers to the calcium content of mature milk.<sup>(3)(11)(9)(12)(13)(14)</sup> The Australian results are low in comparison with those obtained overseas; but there are difficulties in the drawing of a definite conclusion of this nature, owing to the small number of samples examined by the overseas workers, taken together with the wide range in the calcium level.

The magnesium content of mature milk varied from 2.5 milligrammes to 5.0 milligrammes per 100 millilitres. The mean value for the whole time of lactation including the colostrum period was 3.39 milligrammes per 100 millilitres, standard deviation 0.55. No test for frequency distribution was applied, as the small range of magnesium values does not allow a sufficient number of classes. No magnesium estimation was carried out by Ritchie,<sup>(1)</sup> so the Melbourne results are the only ones for Australia. Overseas authors give the following figures: Courtney,<sup>(15)</sup> 5.0 milligrammes per centum; Hasegawa,<sup>(16)</sup> 3.54 milligrammes per centum (200 samples); Bunge,<sup>1</sup> 3.90 milligrammes per centum; Schloss,<sup>(17)</sup> 4.43 milligrammes per centum; Abderhalden,<sup>(18)</sup> 3.92 milligrammes per centum; Toverud,<sup>(19)</sup> 2.18 milligrammes per centum (18 samples); Holt,<sup>(3)</sup> 4.72 milligrammes per centum (51 samples). The Melbourne figure (3.39 milligrammes per centum) seems to approach the lower limit. The mean value fluctuated to a small degree throughout the whole lactation period (Table V); the variations, however, were probably insignificant when related to the experimental error. It may be pointed out that the magnesium content of even the colostrum milk does not differ greatly from the almost constant value of the subsequent period of lactation.

<sup>1</sup> Taken from Holt.<sup>(3)</sup>

<sup>1</sup> Taken from Holt.<sup>(3)</sup>

TABLE V.  
The Calcium, Magnesium and Phosphorus Content of Milk According to the Month of Lactation. (Milligrammes per 100 Millilitres.)

Month of Lactation.	Number of Samples.	Calcium Content.	Magnesium Content.	Phosphorus Content.	Calcium : Magnesium Ratio.	Calcium : Phosphorus Ratio.
1	15	29.8	3.38	15.8	8.7	1.9
2	22	32.0	3.60	14.9	8.8	2.1
3	18	33.8	3.76	14.1	9.0	2.3
4	15	31.5	3.75	14.0	8.4	2.2
5	17	31.2	3.68	14.4	8.5	2.1
6	16	29.9	3.64	13.9	8.1	2.1
7	13	29.1	3.66	13.5	8.0	2.1
8	11	28.0	3.73	13.5	7.5	2.0
9	9	27.0	3.58	13.4	7.6	2.0
10	7	25.9	3.56	11.9	7.2	2.1
11	8	26.6	3.75	12.0	7.1	2.2
12	3	27.5	3.96	11.5	7.0	2.2
13	1	29.6	4.27	12.2	6.9	2.4



This marked constancy in the level of magnesium may be explained on the ground that it forms a safety margin, being able to replace calcium in bone formation.

Calcium and magnesium are "competing" for the phosphorus, and an increasing amount of calcium would tend to depress the formation of magnesium-phosphorus complex (Benjamin *et alii*<sup>(17)</sup>).

The paucity of work done in Europe and America does not permit a significant comparison to be made for the magnesium level in the milk of Australian women.

The calcium:magnesium ratio (Table V) remained fairly constant during the first three months and fell gradually during the remaining period, owing to the fall in the calcium level.

The phosphorus content of mature milk had a range from 9.0 milligrammes to 19.0 milligrammes per 100 millilitres. The mean value fell with the progress of lactation from the colostrum period up to the seventh month (with a slight temporary rise in the fifth month). During the seventh, eighth and ninth months the phosphorus level was maintained, but a sharp decline occurred in the remaining months (Table V). The results obtained are in close agreement with those obtained at Canberra. The combined mean values and the standard deviation are found in Table VI. The frequency distribution curves for individual months have a normal appearance; no test for skewness was made, owing to insufficiency of samples.

In spite of the lack of resemblance between the individual figures,<sup>(11)(12)(13)(14)</sup> it can be seen that the phosphorus content in the milk of Australian women lies below the overseas level. Again, however, the small number of cases investigated overseas has to be taken into consideration.

The calcium:phosphorus ratio (Table V) was found to be remarkably constant in Melbourne, and the same was also true for Canberra, this being in contrast to the results of most overseas workers.

#### SUMMARY.

1. In preliminary work the differences in calcium, magnesium and phosphorus content of milk taken (a) from different breasts, (b) at different feeding times during one day and (c) at the same feeding time on different days were studied. Milk taken at the same time from both breasts of four patients has shown negligible differences in mineral content. The fluctuations during one day studied on nine patients (*primiparae* and *multiparae*) were considerable, being greatest for phosphorus, smallest for magnesium. The differences, however, were much greater for different women than in the case of any individual woman. The day-to-day variations studied on eleven patients were very pronounced during the first five days after parturition. After this a level was reached about which the fluctuations were small. No differences could be shown as between *primiparae* and *multiparae*. The amount of milk excreted had no effect on the mineral level.

2. During the colostrum period, the milk of 212 normal women was examined for calcium and magnesium content and that of 25 women for phosphorus content. The mean value of 28.2 milligrammes per 100 millilitres (standard deviation 5.90) was found for calcium, which is lower than that given by many overseas workers for the colostrum period.

The mean value for magnesium was 3.22 milligrammes per 100 millilitre (standard deviation 0.52). Compared with overseas results, these appear to be within normal limits. The mean value for phosphorus was 15.9 milligrammes per 100 millilitres.

3. During the colostrum period, forty milk samples from eighteen mothers suffering from various abnormal conditions were compared with milk from normal mothers. The conditions included albuminuria, post-partum haemorrhage, eclampsia and prematurity. The mean values for all three minerals were close to the normal ones. (None of the pathological conditions appeared to influence the mineral level in milk.)

4. In the later stages of lactation 155 milk samples from 65 normal mothers were examined at intervals of one

month calculated as lunar months. The mean values tabulated monthly were compared with the results obtained at Canberra for Australian women and with some of the overseas results for European, American and Japanese women. The mean value for calcium rose from the colostrum period through the first, second and third months, when it reached its peak, and then it gradually declined till the eleventh month. Compared with Canberra results, the calcium level has shown the same rise and fall for the corresponding months. The differences in mean values were not statistically significant, owing to the degree of scattering.

The Australian figures appear low in comparison with the results of overseas workers, who, however, for the most part had investigated only a small number of samples. A similar comment may be applied to the results of these workers for magnesium and phosphorus, with the exception of a Japanese investigation for magnesium.

5. The mean magnesium value varied very little during the whole period of lactation, including the colostrum period. The results obtained were close to those of the Japanese workers. The calcium:magnesium ratio remained fairly constant for the first three months, and declined for the remaining period of lactation owing to the fall in calcium level.

6. The mean value for phosphorus, which fell steadily from the colostrum period up to the seventh month, remained at the same level for three consecutive months and then declined up to the eleventh month. This value agrees closely with the Canberra figures. The Australian results for phosphorus are low compared with the overseas figures. The calcium:phosphorus ratio was constant at Melbourne as at Canberra for the whole period of lactation.

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<sup>(5)</sup> A. M. Courtney: *American Journal of Diseases of Children*, Volume XXVI, 1923, page 534; quoted by Toverud, *loco citato*.  
<sup>(6)</sup> K. V. Toverud and G. Toverud: "Studies on Mineral Metabolism during Pregnancy and Lactation and its Bearing on Disposition to Rickets and Dental Caries", *Acta Paediatrica* (Supplement 2), Volume XII, 1931, page 1.

## Reports of Cases.

### A TYPICAL CASE OF FREIBERG'S DISEASE.

By W. D. ACKLAND-HORMAN, M.B., B.S. (Adelaide),  
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#### Clinical Record.

An ordinary seaman, aged eighteen years, reported to the sick bay complaining that he had "stubbed" his foot on a hatch two days earlier, and that it was "feeling sore". On examination, thickening around the second metatarsophalangeal joint of the left foot was present. Heavy pressure over the joint elicited pain. Movements, both active and passive, were reduced in extension and flexion. Crepitus was detected. He had no limp, although he could feel pain when walking. An X-ray examination revealed that the joint line was widened and flattened, and a loose body appeared to be present. The metatarsal shaft was thickened and the neck had disappeared. All these findings were evident on comparison with the right foot, which was normal. Treatment consisted of strapping with "Elastoplast", which relieved his pain immediately; he did not return for further treatment.

Reexamination by X rays two months later revealed no change in the condition. He had no symptoms and did not think his toe was any different from the corresponding one on the right side. However, a mild degree of static incompetence was present, for when he stood on the toes of his left foot alone, he complained of pain in the affected joint. Close questioning revealed no former history of trauma.

#### Commentary.

Freiberg<sup>(1)</sup> first described this condition as a "traumatic infraction of the second metatarsal bone". He suggested that the cause was that, since the second metatarsal bone is slightly longer than the first, it will consequently bear the brunt of a forcible impact of the ball of the foot against the ground. Koehler denied that trauma played a part in the aetiology, and Freiberg<sup>(2)</sup> in a later article agreed with him. Apparently trauma plays no part in this case.

Is this condition, then, intermediate between the normal foot and *metatarsus atavicus*? In the latter condition the first metatarsal is so much shorter than the second that the increased strain causes the so-called "march fracture". X-ray appearances of the bone would suggest an impairment of the blood supply. This could perhaps be caused by repeated minor traumata setting up periostitis, which in turn has produced a periosteal thickening of the bone and an avascular necrosis of the head, which has since undergone disintegration. Freiberg<sup>(2)</sup> had one case in which periosteal thickening was present and the head was unaffected. If the condition was not arrested, we might justifiably think it would progress to an avascular necrosis of the metatarsal head.

Treatment by a felt pad or "Elastoplast" adjusted so as to give support may be satisfactory. If this method is unsatisfactory, Jewett<sup>(3)</sup> recommends the wearing of a plaster cast for six months and reports a case in which a cure was achieved by this method. Freiberg found that dorsal arthrotomy for removal of loose bodies usually gave relief. Radical surgical treatment consists of excision of the joint or finally amputation of the toe.

#### Summary.

1. A typical case of Freiberg's disease is described, with X-ray appearances.
2. Aetiology and treatment are discussed.

#### Acknowledgement.

Thanks are due to Surgeon Captain W. J. Carr, C.B.E., Director of Naval Medical Services, for permission to publish this article.

#### References.

<sup>(1)</sup> A. H. Freiberg: "Infraction of the Second Metatarsal Bone: A Typical Injury", *Surgery, Gynecology and Obstetrics*, Volume XIX, 1914, page 191.

<sup>(2)</sup> A. H. Freiberg: "The So-Called Infraction of the Second Metatarsal Bone", *The Journal of Bone and Joint Surgery*, Volume VIII, 1926, page 257.

<sup>(3)</sup> E. L. Jewett: "Case of Freiberg's Disease Treated by Walking Cast", *The Journal of Bone and Joint Surgery*, Volume XXI, 1939, page 778.

## Reviews.

### MEDICAL DISEASES OF WAR.

THE first draft of this review of "Medical Diseases of War" had been sketched when the *British Medical Journal* of August 26, 1944, arrived giving the news of the death of the author.<sup>1</sup>

His book, which first appeared in 1916 as "Medical Diseases of the War", took its new name with a first edition in 1940—and this is the fourth. Naturally there have been changes. The 1916 edition was a slim volume and all Hurst's own work. With these later books he has had an increasing group of helpers. He wished to make certain that those diseases worthy of inclusion should have the best treatment he could procure.

There are not many great changes in this edition—the added chapters still stand. Colonel H. B. F. Dixon writes on malaria, Dr. M. D. Mackenzie (formerly of the Nansen Relief Expedition to Russia) on louse-borne typhus, and the late A. T. Ross has still his incomparable chapter on anxiety neurosis. These are little changed; only a few additions appear with increasing experience and new drugs. On the other hand, H. W. Barber has rewritten his chapter on skin diseases. In this much space is devoted to the dermatophyses, and this section will be of great interest to those treating these troublesome conditions. Unfortunately there is no mention of the various difficult skin conditions found in tropical jungle troops. From various reports British troops in Burma have suffered as gravely as Australians in New Guinea. Another very important and troublesome skin condition which is not described is chronic *otitis media externa*—"Aden ear", "Singapore ear" and so on.

The sections on pediculosis and scabies were written before the advent of D.D.T.; accounts of its miraculous delousing effects in Naples make the last war methods, which Barber details, very dull reading.

This applies with even greater effect to Dr. M. D. Mackenzie's measures for delousing in typhus epidemics. At the close of his chapter he makes reference to the "new methods which may eventually supersede the older methods"—"various powders lethal to lice"—and "methyl bromide carried in glass ampoules to be crushed inside sacs containing the infested clothing"; but mass high-speed delousing was still to be demonstrated.

The chapter on the meningococcus infections (meningitis and septicæmia) by Major-General Stott is still a sound piece of work—but here, too, as in so many other war diseases, penicillin had yet to come.

The chapter on bacillary dysentery gives an account of post-dysenteric colonic irritability. It is not a very helpful chapter, but at least Hurst does not entirely ignore this very troublesome condition as do some text-books. The remainder of the chapter gives an excellent and reliable account of the course and treatment of this plague of armies.

<sup>1</sup> "Medical Diseases of War", by Sir Arthur Hurst, M.A., D.M., F.R.C.P., with the cooperation of H. W. Barber, M.A., M.B., F.R.C.P., H. B. F. Dixon, M.C., M.D., D.T.M. and H., F.R.C.P., E. H. R. Harries, M.D., F.R.C.P., D.P.H., F. A. Knott, M.D., F.R.C.P., Melville D. Mackenzie, M.D., D.T.M. and H., T. A. Ross, M.D., F.R.C.P., and Arnold W. Stott, M.A., F.R.C.P.; Fourth Edition; 1944. London: Edward Arnold and Co. 8½" x 5½", pp. 519, with illustrations. Price: 21s. net.

There is, of course, the long series of chapters by Hurst himself on war neuroses, with the fierce denunciation of all methods of approach other than the Janet technique. Of this it is true Hurst was a master and he inspired his colleagues at Seale Hayne with his own belief—a belief that they transmitted to their patients—so that the “curative atmosphere” was very strong. Similarly Hurst rejected all explanations of a Freudian mechanism in these cases; and he is a remarkable example of what Millais Culpin has pointed out, that the less extensive a doctor's investigation of patients' psychological makeup may be, the more likely is he to be able to achieve dramatic success by Janet's methods. (The writer of the biographical notice in the *British Medical Journal* of August 26, 1944, notes that this was one of the few branches of medicine in which Hurst refused to accept newer developments.)

Hysterical back and its congeners are described and triumphantly cured by psychotherapy. After the vigorous (some would say acrimonious) controversy on sciatica and kindred ailments in the *British Medical Journal* some months ago, it is quite a disappointment to read this chapter. Actually the author seems to accept the extruded intervertebral nucleus as a genuine clinical entity. But there is a fine fighting spirit in the discussion, and the light-hearted believers in a physical basis for every painful back are given much food for thought.

In previous editions the inclusion of trench nephritis and trench fever seemed of little more than historical importance, but this winter, with armies again fighting in the mud of France and the Low Countries, may bring them back, though here, too, D.D.T. will play its part in prevention.

In this connexion it is interesting to note that just as McNee's research on trench fever was blocked in 1915 by the higher command, so, according to Professor Witts, the investigation of infectious hepatitis by von Roogen was blocked in 1943 (*The Lancet*, September 2, 1944).

The historical note on trench fever and its causative organism *Rickettsia quintana* will interest many last war medical officers.

A very fine chapter and Hurst's own is that on jaundice. It will no doubt be a shock to many of our present-day clinicians to know that there really is such a disease as acute catarrhal jaundice. It was the jaundice of Gallipoli and the 1915 Eastern Mediterranean area which Hurst knew well. The other common jaundice of the last war was Weil's disease on the Western Front. With this war has come infectious hepatitis, again at first appearing in the Mediterranean area. The jaundice of post-arsenical injections is mentioned shortly, but no reference is made to the fact that this occurred in France (in Etaples at least) in 1918 and disappeared only on drastic lowering of dosage.

One again misses influenza, so far as yet no great problem, but perhaps waiting. Asthma, too, may make some claim—for in certain sections of the services it seems that asthma is becoming an increasingly frequent manifestation of a neurosis. It would have been singularly appropriate had Hurst included it, for he wrote much common sense among a mass of fancy. He was one of that band of doctor-patients who have so illuminatingly described their own diseases—all his life he was a martyr to asthma. He died in a severe attack, adrenaline syringe in place, no doubt as he was giving himself that “minim a minute injection”, which has served to relieve so many others. A great physician—this little book is worthy of him.

#### ILLINGWORTH'S TEXT-BOOK OF SURGICAL TREATMENT.

Or Illingworth's text-book, it may immediately be said that it is a good book and probably the best single volume on surgical treatment in the English language. It is a book entirely by Scottish authors, the work of nineteen contributors, being evenly collated by the Regius Professor of Surgery at Glasgow. It has all the advantages of a modern work, the first edition appearing only in 1943, while already, a year later, the chapter on the treatment of burns has been entirely rewritten as the result of war experience. In spite of the many authors, the evenness of handling is remarkable.

<sup>1</sup>“Textbook of Surgical Treatment including Operative Surgery”, edited by C. F. W. Illingworth, M.D., Ch.M., F.R.C.S.E., compiled by nineteen contributors; Second Edition; 1944. Edinburgh: E. and S. Livingstone Limited. 9½” x 6”, pp. 576, with many illustrations, some of which are in colour. Price: 30s. net.

Where there seem to be omissions or insufficient detail it is probably because this is a book intended for the junior surgeon, and procedures which would be outside his scope are therefore treated briefly. Even when such allowances are made, however, the discussion of the indications for gastric surgery seems somewhat sketchy. In the treatment of carcinoma of the rectum, also, insufficient emphasis is laid on the advantages over other methods of one-stage abdomino-perineal resection of the rectum. A two-stage operation to which Devine's name is attached is much more generally accredited to Lahey. The advocacy of jejuno-transverse colostomy in intestinal obstruction is relatively new.

In a discussion of the subject of low back pain, less than adequate attention is given to injury of the intervertebral disks.

The advocacy of sodium morrhuate as the best sclerosing solution for varicose veins seems doubtful wisdom. There is surely considerable authority for the belief that this is the most dangerous solution for the purpose.

Only a very few typographical errors were noticed, mainly in relation to the position of decimal points. The hernia recurrence rate after simple excision surely should be 9.2% rather than 92%; while in chronic mastitis stilbestrol five milligrammes three times a day would be a huge dose. These, however, are but minor blemishes, and detract nothing from the general excellence of the book. The printing and the paper are both good, the illustrations numerous and clear. This book deserves a place on the bookshelf of all who practise, or aspire to practise, surgery.

#### MANUAL OF HUMAN PROTOZOA.

R. R. Kudo has written a useful small book for the routine laboratory worker. The protozoa likely to be encountered in the examination of material for diagnosis are relatively few in number, and the author's survey is limited to these. The plan is a simple one; three divisions are made—parasites present in the digestive tract, in the circulatory system, and in the genital tract and muscle. Appearances of vegetative and encysted forms in fresh or stained preparations are fully described, and with the exception of *Balantidium coli*, all illustrations are drawn from identical magnifications, and so are particularly useful for purposes of comparison.

Technique of preparation of fresh and fixed material and also extraneous objects which may cause confusion to the inexperienced are carefully described. The paper and printing are admirable.

#### Notes on Books, Current Journals and New Appliances.

##### “WE DROVE THE AMERICANS.”

A CHEERFUL account of their adventures during a period spent as transport drivers to the American army is given by two young Australian wives.<sup>1</sup> They had gone to Brisbane with the object of being near their husbands, who were stationed in Queensland, and were full of plans for sharing a flat and having a rest after strenuous voluntary war work done in their own State. However, when they arrived in Brisbane they found that everyone was doing full-time work, and it was not long before they were drawn in with the rest. As voluntary drivers attached to an American motor-car pool, they worked hard for long hours—harder than they had ever expected to work. But life was full of interest, and also of charming American officers, who are introduced to the reader in a series of bright pen-pictures. The little book is written with pleasing intent; the authoresses explain that they have made the sundial's motto their own—“*Horas non numero nisi serenas*”. It will pleasantly occupy a leisure hour or so.

<sup>1</sup>“Manual of Human Protozoa: With Special Reference to their Detection and Identification”, by Richard R. Kudo, D.Sc.; 1944. Springfield: Charles C. Thomas. 7” x 5”, pp. 134, with illustrations. Price: \$2.00, postpaid.

<sup>2</sup>“We Drove the Americans”, by M. Mann and B. Foott; 1944. Sydney: Angus and Robertson, Limited. 7½” x 5”, pp. 192. Price: 6s.



## The Medical Journal of Australia

SATURDAY, DECEMBER 23, 1944.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

### PERFORATED PEPTIC ULCER.

SURGICAL operation finds a place in the treatment of peptic ulcer much less often than was customary a decade or two ago. It has been said that the life history of ulcer ends only with the life of the patient. If this is true, and it no doubt generally is, the cynic will possibly declare that the lessened frequency of gastric cobbling merely reduces the number of unpleasant episodes that the peptic ulcer patient may have to face—that there has been no fundamental addition to knowledge—but opinions will differ about this. One of the reasons for the changed attitude towards surgical interference in the treatment of peptic ulcer is the growing understanding of the part that psychological factors may take in its causation. However, the one complication in the presence of which laparotomy cannot be avoided is perforation. When this happens the patient does not become merely a "surgical case", to be looked on as cured when the operation wound has healed and more or less normal activities can be resumed. Then more than ever must the cause of the ulcer be sought and treatment be skilful, because the patient has had an additional handicap placed upon him and a recurrence of perforation may take place.

In regard to the kind of ulcer which perforates, Devine in his book on surgery of the alimentary tract states that in practically all the cases in which he has operated for perforation of a gastric ulcer, he found that the patient had had no previous painful dyspepsia, this is to say, he had given no clinical indication of a chronic ulcer prior to the perforation. This made Devine think that the majority of gastric perforations occurred in acute or sub-acute ulcers. At operation, however, he has found in most instances what appeared to be a chronic ulcer, "There was a fair amount of inflammatory thickening around the

edge of the perforation, but it was that degree of infiltration of subacute or mild chronic ulcer the stimulation of which was not adequate to produce pain." This reasoning, he thought, explained why the symptoms were those of acute ulcer, while the findings at operation were those of chronic ulcer. He thought that in some cases this type of infiltration might be the result of a secondary infection arising in an acute ulcer, and that probably the perforation coincided with the advent of the secondary infection. In this regard he refers to observations by Puhl and Schmidt, which show that a secondary inflammatory process is not the cause of a perforation, but that the perforation is due to the action of the corrosive gastric juice. Since perforation of an ulcer not infrequently occurs from two to three hours after a meal, Devine thinks that probably most perforations are due to the action of unbuffered gastric juice on the wall of an empty stomach or duodenum which may or may not be the subject of some temporary devitalization. Devine also quotes findings by Wright-Smith that 22 of 97 chronic ulcers examined *post mortem* were from patients who during life had complained of no symptoms suggestive of chronic ulcer. It may also be recalled that some years ago Henry Searby, of Melbourne, in reporting 53 cases of perforated peptic ulcer,<sup>1</sup> described two types of perforated ulcer. One was a type in which there were present a marked inflammatory condition, a large area of induration, deposits of lymph in the vicinity, and usually definite gastritis. In the other type there was a small callous ulcer with little or no inflammatory change around it. In none of his cases was perforation due to an "acute" ulcer. All these opinions and findings should be considered in the light of the now classical observations of S. Wolf and H. C. Wolff.<sup>2</sup> These two observers recorded the extraordinary case of a man, aged fifty-six years, who for forty-seven years had suffered from complete occlusion of the oesophagus and had fed himself through a gastric fistula, 3.5 centimetres in diameter, surgically produced soon after the oesophageal occlusion. In this subject the effects of the emotions could be observed with the naked eye. Emotions such as fear and sadness, which involved a feeling of withdrawal, were accompanied by pallor of the gastric mucosa and by inhibition of acid secretions and contractions. These changes were not often observed. On the other hand emotional conflict involving anxiety, hostility and resentment was accompanied by accelerated acid secretion, hypermotility, hyperæmia, and engorgement of the gastric mucosa resembling "hypertrophic gastritis". This series of events was much more commonly observed than the other, and was associated with complaints like heartburn and abdominal pain. Intense sustained anxiety, hostility and resentment were accompanied by severe and prolonged engorgement, hypermotility and hypersecretion of the stomach. In this state mucosal erosions and hemorrhages were readily induced by even the most trifling traumata and frequently bleeding points appeared spontaneously as a result of vigorous contractions of the stomach wall. Contact of acid gastric juice with a small eroded surface in the mucous membrane resulted in accelerated secretion of acid and further engorgement of

<sup>1</sup>The Australian and New Zealand Journal of Surgery, Volume II, 1932-1933, page 168.

<sup>2</sup>The Journal of the American Medical Association, Volume CXX, 1943, page 670; abstracted in "The Medical Annual", 1944, page 125; see also THE MEDICAL JOURNAL OF AUSTRALIA, February 20, 1943, page 164.

the whole mucosa. Prolonged exposure of such a lesion to acid gastric juice produced a chronic ulcer.

The available knowledge of the causation of peptic ulcer and of the circumstances leading to perforation must be applied in the treatment of patients whose ulcers have perforated. To neglect any of the present-day knowledge will probably tip the scales against the patient, for, as already stated, he has a double handicap. Nowadays when a diagnosis of perforation is made and operation is undertaken without loss of time, the simplest possible procedure is generally adopted and this consists in the use of simple suture; only rarely is gastro-enterostomy or excision of the ulcer adopted. Once the patient has recovered from the ordeal of operation he has to be prepared to take his place again in society. Whether he will be successful will depend upon the wisdom with which he is handled by his doctor, and upon his own willingness and ability to carry out the spirit as well as the letter of his instructions. The kind of result that may be expected in any series of patients who recover from operations for perforated ulcer is shown in a report that comes from the Boston University School of Medicine and is written by A. C. Williams.<sup>1</sup> This author has studied the late histories of 100 patients who recovered from operation for perforation of a peptic ulcer and were discharged from hospital. In 28 cases the results were appraised as excellent, in 27 as good, in 22 as fair and in 23 as poor. Results were classed as excellent when there was no recurrence of symptoms, when barium studies revealed no ulcer activity and when the patient was able to return to and remain at work. A good result was one in which mild symptoms such as occasional epigastric discomfort and belching of wind were experienced, but did not interfere with work and were controlled by diet. These two groups comprised what Williams calls his satisfactory group and included 55% of the patients. In view of the statements quoted from Devine's book it is worthy of note that 23 of the patients in this series had never suffered from ulcer symptoms of any sort prior to perforation. No information is given of the appearance of the ulcers at the time of operation, but generally speaking the poorness of the results after perforation varied directly with the length of time during which symptoms were present before perforation. As a matter of fact seventeen of the twenty-three patients with no symptoms before perforation enjoyed a satisfactory result. Unsatisfactory late results were more than twice as common among patients who had had symptoms for six months or longer as they were among those who gave no history of symptoms before perforation. When the question of recurrence was investigated in relation to diet and the use of alcohol and tobacco, some unpredictable results were obtained. It did not by any means follow that care in the matter of diet, alcohol and tobacco was a guarantee against recurrence, and many who took no particular care were free from recurrence. It is concluded that there are factors more potent than diet in determining the behaviour of an ulcer—"the necessity for following a strict ulcer regime varies from patient to patient and in any one patient is unpredictable at the outset". The determining factor would appear to be the psychological one. Williams states that its importance is clearly recognized. He found that in many cases "personality was a dominant cause of the ulcer difficulty". As it appeared to him to be too

complex to lend itself to accurate evaluation, it did not seem practical for the psychological factor to be included in the study. Williams also describes the psychological factor as the most inaccessible from a therapeutic standpoint—it is, he thinks, the one chiefly at fault "in the ulcers that are most stubborn and virulent in the face of medical treatment". Of the difficulty of the assessment and treatment of the psychological factor in peptic ulcer there can be no doubt. That an attempt should be made to deal with it is just as important in perforated as in non-perforated ulcer. In all probability some clinicians neglect the psychological factor or pay insufficient attention to it just because it is inaccessible and difficult to treat. The work of Wolf and Wolff has been mentioned and shows beyond all doubt that the psychological factor cannot be neglected. But its effect cannot easily be gauged. E. Wittkower has shown<sup>1</sup> that emotions such as fear, disgust and joy do not always produce the same effect on gastric secretion, but that each person has a characteristic response, that is, an increase or decrease of gastric secretion. The general conclusion is that accurate diagnosis and surgery of the highest skill are not alone sufficient to secure the welfare of a patient with perforated peptic ulcer. Even the most meticulous attention to diet and to the use of alcohol and tobacco at the direction of a physician devoted to these aspects of therapeutics will not suffice. The patient presents a psychological problem, and this waits for solution on the understanding of the make-up of the individual man and of the peculiar nature of his environment.

## Current Comment.

### THE ACRIDINE ANTISEPTICS.

It is interesting to trace the periodic rising and falling of enthusiasm over antiseptics, both systemic and local. When aseptic techniques began to dominate surgical procedures there was a waning of popularity in antiseptics, but soon a renaissance took place, particularly during the last war. Some of the claims were excessive; for example, the intravenous use of antibacterial agents was based on faulty premises in some cases, and interest waned once more. During the last war considerable attention was paid to some members of the acridine series, particularly acriflavine. As time went on acriflavine and proflavine were used extensively in surgical work, and it was thought that their advantages and drawbacks were fairly well known. Their application to systemic or general use was found to be limited on account of toxicity, and even in local use toxic effects were not unknown. Further, it was found necessary to reckon with bacterial adaptation, a problem still troubling us somewhat in spite of the potency of the newest antibacterial weapons that we possess. Discrepancies appeared in the literature, and even to this day certain problems are not satisfactorily solved, such as the effect of these acridine compounds on living tissues. Gustav J. Martin, in a recent comprehensive review of the subject, points out that the earlier investigators did not always realize that they were dealing with impure compounds, this being particularly the case with acriflavine.<sup>1</sup> It is characteristic of the modern wedding of chemical and bacteriological investigations that now, when the extraordinary value of sulphonamides and penicillin are so evident, the need for more accurate work on other anti-

<sup>1</sup> *The New England Journal of Medicine*, June 29, 1944.

<sup>1</sup> *Medicine*, February, 1944.

septics is carrying the wave of interest in the acridines to a still higher plane. We recognize that it is necessary to have at our command more and more highly specialized chemical weapons and to know their indications and limitations. As Martin remarks, it is to be expected that bacterial "fastness" or resistance to these weapons will become a commonly occurring phenomenon. This challenge is being met, and the modern surgeon, after reviewing the general state of the patient, particularly the haemoglobin in his blood, and removing dead tissues and dressing the wounds with a most scrupulous technique, first determines what bacterial flora are to be attacked and then chooses the appropriate method. This has been clearly pointed out by H. R. G. Poate in this journal.<sup>2</sup> But before such specificity of attack is possible, the labours of the chemist in the laboratory must forge the weapon. These are often as the labours of Hercules, but considerably less publicized than the performances of that famous strong man, who, even in mythical days, had what is known as "a good Press". In the case of the acridine series these labours have been considerably reduced and an ideally scientific connexion has been established between molecular structure and antibacterial activity by Albert and his co-workers. For example, their important classification of the mono-amino-acridines has placed these substances in three groups, of high, moderate and low antiseptic action, and has shown that these groups correspond to such qualities as a high, moderate or low chemical basicity and the presence of an amino grouping, a normal or a masked amino grouping. However little the surgeon may be interested in chemistry, he must pay tribute to these fundamental concepts which are so clinically important. Martin in his review traverses not only the purely chemical aspects of the work on acridines, but also the clinical applications. He considers that further work is called for on the action of acriflavine and proflavine on tissues, and on microorganisms, as some of the published results are discordant, owing probably to variations in the solutions used. In the study of a review such as this it is evident that, despite the valuable foundations laid some years ago, the most valuable work is comparatively recent. Indeed Martin, referring particularly to the work of Mitchell and Buttle, admits that some of the recent clinical evidence in practice outweighs other evidence. It is most important therefore that all who essay to use the acridine antiseptics with full modern knowledge must not neglect important practical points, even though these seem to depend on purely theoretical considerations. The avidity with which some of these substances are adsorbed onto dressings is a case in point. Victor Bonney and H. Sandeman Allen, in describing a modification of Bonney's well-known dye method of skin sterilization in which colourless flavine replaces the old green and violet dyes, stress the importance of soaking the dressing to capacity and preventing evaporation.<sup>3</sup> This colourless acridine, 5-aminoacridine ("Monacrine"), and 2:7 diaminoacridine now appear to occupy the field together with proflavine. The first of these is as active as proflavine, and as Albert pointed out in his succinct appreciation of antiseptics in this journal,<sup>3</sup> it is a neutral hydrochloride, needing no adjustment of pH. Proflavine sulphate is unduly acid and should be neutralized by sodium bicarbonate; Martin refers to the advantages of the more recently introduced hydrochloride. The 2:7 diaminoacridine appears to be of promise; as Albert points out, it is rather more active and rather less toxic than the others.

Certainly a high standard of wound disinfection is being set. It demands work by highly specialized teams. Certainly in some cases it will be hard to assess the relative roles of penicillin, sulphonamides and acridines where all play their part in rescuing the sufferer of grossly infected wounds. Nevertheless there is no excuse for clinical vagueness where precision is possible, and a knowledge of the infective agents and their reactions to antibacterial substances, with a correct appreciation of the relationships of chemical structure to effect, and a faultless technique should yield rich rewards.

The ordinary plain doctor frankly will not understand a good deal of the chemical side of the literature of these drugs, no matter how kindly the writers try to simplify it, but he must understand clearly what he does and why. Then he will all the more justly and freely be grateful to specialist chemists; they may have given the world high explosives, but they have also given it antibacterials of high potency.

#### THE TRANSMISSION OF HEART MURMURS.

SURELY many experienced teachers of clinical medicine must have envied their students for their faith in the conventional explanations of the acoustics of heart murmurs. Rightly there has been a swing from too great an absorption in the importance of hearing murmurs, but they are significant phenomena for all that. The only difficulty is that of being sure of what they are significant. S. A. Levine and W. B. Likoff in a paper on the transmission of heart murmurs have set out a number of difficult questions and have cast doubt on some of the conventional teaching.<sup>1</sup> It is certainly time that some of it was questioned. The exact site of origin of the sound vibrations of the murmurs produced in aortic stenosis or in mitral valvulitis is an interesting subject for debate. It might appear at first sight to be somewhat academic, but Levine and Likoff point out that the site of origin makes a difference to the point of maximum audibility. They state that in coarctation of the aorta, for example, the murmur is produced deep in the chest and is therefore transmitted in all directions and heard all over the chest. It is still usually taught that aortic murmurs are transmitted to the neck and mitral murmurs to the axilla, suggesting that transmission of the sound tends to follow the blood stream. Levine and Likoff object that the speed of transmission of sound through blood is much faster than the velocity of blood flow, and that therefore in the interpretation of sound directions of flow should be disregarded. They further believe that transmission of a murmur depends upon its intensity. They produce proof of this by graphic records. They also point out that a murmur is transmitted in all directions from the point of greatest intensity and that once it strikes bone it will be transmitted through contiguous bony structures. They have produced proof of this in one case in which the murmur was clearly heard and easily recorded over the point of the elbow even after occlusion of the brachial artery. Some of the records in this paper also support the contention that it is intensity that is important in transmission.

The relation of a murmur to breathing is also not easy to evaluate. Even murmurs incontestably due to organic damage have been found to be considerably decreased in intensity by deep inspiration. The authors no doubt express general belief when they remark that "the entire subject of extra-cardiac murmurs is very perplexing". We surely cannot argue with them when they state that "it would seem fallacious to teach that a murmur that disappears or decreases strikingly with deep inspiration is necessarily unimportant or extra-cardiac". Similarly the occurrence of systolic murmurs after exercise cannot *per se* be regarded as abnormal.

No one can doubt that there is still plenty of room for clinical research on this subject of heart murmurs. The last few years have perhaps made more manifest the dangers of rigid views too often unsupported by adequate physical facts, but it is not only in examining recruits for the services that errors can be made; the lives of individuals may also be clouded without good reason. Judgement of the significance of auditory impressions must be tempered by thought and a broad view of each individual case, despite certain dogmatisms from which teaching in the subject of cardiac auscultation is not quite freed.

<sup>2</sup> THE MEDICAL JOURNAL OF AUSTRALIA, March 18, 1944.

<sup>3</sup> British Medical Journal, August 12, 1944.

<sup>1</sup> Annals of Internal Medicine, August, 1944.



## Abstracts from Medical Literature.

### DERMATOLOGY.

#### Scabies.

H. MACCORMICK (*The Practitioner*, May, 1944) states that scabies is noticed in three forms: uncomplicated or straight scabies, scabies complicated by pyoderma, scabies complicated by eczema or dermatitis. In these three varieties, diagnosis relies upon the type of eruption and its distribution. There are three types of uncomplicated (straight) scabies: (a) the scratched papule or follicular papule of which most of the eruption is composed; (b) vesicles; (c) burrows, that is to say, curved or angular lines representing the tunnel made by the female parasite. The scratched papules are collected and grouped about the anterior axillary folds, and over the abdomen in a circle centred by the umbilicus. A reddish raised band or linear blob is often observed on the axillary fold and rim of the navel, a most characteristic reaction of the sensitized scabetic skin. The pin-head vesicles and burrows are mostly on the hands and wrists, especially on the webs of the fingers. The back is relatively free. In scabies complicated by pyoderma impetiginous sores form on the lower part of the buttock, elbows and knees. Indeed a grouped impetigo on the lower part of the buttock can have only one interpretation, and its paramount importance cannot be too strongly emphasized. It is often present and fully developed in adults, both male and female, when the eruption elsewhere is sparse and doubtful—a simple and all-sufficient key to a difficult problem, which only needs looking for. In pediculosis the upper part of the buttocks and lumbar regions are similarly selected by impetigo. With regard to scabies complicated by eczema or dermatitis, a potentially eczematous subject is able to develop slight or extensive eczema or dermatitis from the irritation caused by the parasite, that is, independently of any external application whatsoever, and these cases are usually and improperly classified by the careless observer as examples of sulphur dermatitis. Dermatitis is also met with when sulphur or some other sarcopticide has been used or abused, the result of under-treatment or over-treatment. In these cases the eruption is apt to be most pronounced over friction areas. Finally, in any of the above cases, if a burrow can be found and a mite is removed for microscopic examination, this establishes the diagnosis beyond question. In differential diagnosis consideration should be given to industrial dermatitis. Both scabies and many kinds of trade eczema affect the hands, but the first is usually polymorphic with pathognomonic burrow, and the second is usually eczematous. Scabies has also its characteristic elements elsewhere. The consequences of a mistake are most unfortunate, because the workman is thereby prevented, perhaps for weeks, from working and earning wages. The traditional treatment of scabies required three separate stages: first, a warm soap bath in which burrows were

scrubbed open; secondly, the application of the selected medicament all over below the neck upon an agreed number of occasions; and thirdly, disinfection of contact day and night clothing and bedding. Two sarcopticides have a sufficiently high efficiency index, namely, sulphur ointment and benzyl benzoate. If sulphur ointment is used it is applied on three consecutive nights; benzyl benzoate emulsion is, however, only used twice, either on two consecutive nights, or the second treatment is given one week after the first. It will be noted that with both sulphur and benzyl benzoate a preliminary bath is taken, that the remedy is applied all over below the neck, and that some simple method of disinfection is recommended. Patients are often inclined to overtreat themselves, with no advantage, but thereby certainly increasing the risk of post-scabetic dermatitis. Renewed itching is a warning against further active remedies and soap and water, and calls for rest and the application of simple ointments and creams.

#### Pemphigus.

W. F. LEVER AND J. H. TALBOT (*The New England Journal of Medicine*, July 13, 1944) have shown in two recent communications that significant changes in the electrolyte content of the blood serum occur in patients with pemphigus vulgaris. In an attempt to correct the chemical changes, they have treated patients suffering from pemphigus vulgaris with adrenocortical extract, dehydrotachysterol or massive doses of vitamin D. Sixty types of pemphigus are recognized—pemphigus vulgaris acutus, pemphigus vegetans, pemphigus vulgaris chronicus, pemphigus foliaceus, pemphigus erythematosus and pemphigus conjunctiva. In pemphigus vulgaris acutus, pemphigus vegetans and pemphigus chronicus, the amount of sodium chloride, calcium and protein in the blood serum was found to be reduced. These changes were more pronounced in pemphigus vulgaris acutus and pemphigus vegetans than in pemphigus vulgaris chronicus. The degree of reduction usually corresponded to the severity of the clinical condition and the amount of skin involved. No aetiological significance can be attached to the chemical changes. They are regarded as a secondary symptom produced by the disease. Thirty-two patients with pemphigus were treated with adrenocortical extract, dihydrotachysterol or massive doses of vitamin D. The authors give the recommended dosages. Encouraging results were obtained in several patients with pemphigus vulgaris acutus, pemphigus vegetans and pemphigus vulgaris chronicus. The results of treatment in patients with pemphigus foliaceus, pemphigus erythematosus and pemphigus conjunctiva were in general disappointing. The treatment tends to correct the reduction of sodium chloride, calcium and protein encountered in such patients. Since it is believed the chemical changes are secondary symptoms produced by the disease, the treatment is merely symptomatic.

#### Sulphonamides in Dermatology.

H. W. BARBER (*The Practitioner*, May, 1944) states that, as with all new methods of treatment, the use of sulphonamide compounds has been

grossly abused. They have been, and still are, prescribed without rhyme or reason for conditions in which they could do no possible good and might well prove actually harmful or dangerous. At the present time there is a remarkable difference of opinion amongst dermatologists concerning the efficacy of the local application of sulphonamides in pyodermias, such as impetigo, and the risk of sensitization that such treatment entails. The argument involves two main considerations: first, whether or not the topical use of the sulphonamides is so superior to older methods of local treatment that it is justifiable to take the slight risk that sensitization of the skin to them may occur; and secondly, whether or not the results of sensitization may be so serious as to preclude entirely the local application of these drugs in superficial pyogenic infections. The author is not convinced that sulphonamide or sulphathiazole affords quicker results than those obtained by older and eminently safe methods. The author has an impression that sensitization is more likely to occur with sulphanilamide than with sulphathiazole, and the statements of those who claim to have treated hundreds of cases of impetigo and other pyodermias with 5% sulphathiazole paste without ill-effects cannot be ignored. On the other hand sensitization to this drug does occur. The author quotes D. M. Pillsbury and his co-workers, who state that they have seen several cases of sensitization to sulphathiazole, but on the other hand they have rarely met with sensitization to sulphadiazine when applied locally as a cream or when given internally. In eczematous dermatitis it is the Malpighian cells of the epidermis that are sensitized, and it is repeated contact of the sulphonamide with these, when the stratum corneum is destroyed or damaged, that provokes the eczematous response. Therefore it is in the treatment of superficial skin affections that this response may occur, and not in that of deep wounds or burns in which the whole epidermis has been destroyed. The author then discusses the principles of internal treatment with sulphonamide for three groups of skin diseases: (a) those caused by acute infection with various organisms; (b) chronic diseases due, or suspected to be due, to infective organisms; (c) certain eruptions that are, or may be sometimes, caused by bacteremia or by the circulation of bacterial toxins. In an acute and severe case of impetigo contagiosa the following dosage is recommended by the author: 2.0 grammes are given with a tumbler of water at 8 a.m., 4 p.m. and at bedtime on the first day, and 1.5 grammes at the same times on each of two or three succeeding days—a total of 15.0 to 19.5 grammes. Sulphathiazole is more effective than sulphanilamide in staphylococcal infection and sulphapyridine appears to be the drug of choice in dermatitis herpetiformis, pemphigus vulgaris and pemphigus vegetans.

#### Treatment of Psoriasis with Sarsaparilla Compound.

T. S. SAUNDERS (*Archives of Dermatology and Syphilology*, July, 1944) treated for varying periods twenty-seven patients suffering from chronic psoriasis with an extract of sarsaparilla, the active principle of which is the water-soluble saponin, sarsasaponin.

About half showed a favourable response. Local treatment (tar salves, "Anthraxen" ointment and ultra-violet rays) in combination with the sarsasaponin was more effective than the sarsasaponin alone. The duration of benefit from the drug is probably limited to the time of administration. Sarsaponin, a non-toxic, non-irritating drug, represents a conspicuous addition to the therapeutic agents (for internal use) against psoriasis. It apparently embraces the effect of local therapy, although possessing some independent action.

## UROLOGY.

### Bladder Neck Hyperplasia in the Female.

J. A. HYAMS AND S. R. WEINBERG (*The Journal of Urology*, February, 1944) made a study of hyperplastic changes in the urethra and vesical neck in the female by reviewing the embryology, and by making serial microscopic sections of post-mortem material and of biopsy specimens from clinically proved cases of urethritis. In isolated cases periurethral tubules (female prostate) were observed, but these are not thought to have any significance. Cystic degeneration was the most constant pathological change found. If inflammation is present, it becomes chronic and difficult to eradicate because of these cysts in the transitional epithelium of the urethra. Hyperplastic changes at the vesical neck in the female are relatively frequent and associated with considerable urinary disturbance and pain. Diagnosis is based on careful cystourethroscopic examination, and treatment consists of the use of surgical diathermy, local applications, sedation, urethral dilatation and urinary antiseptics.

### Hypertension in Surgical Renal Disease.

J. D. KIRSHBAUM (*The Urologic and Cutaneous Review*, March, 1944) describes a case of unilateral renal lithiasis of very advanced degree, associated with hypertension. It was hoped that removal of the affected kidney, which was performed for purely surgical reasons, might benefit the hypertension. In this expectation the author was disappointed. Many similar cases, however, have been reported when the result has been good in regard to the hypertension. Failure in this case may have been due to several reasons: (i) The pathological processes responsible for the hypertension became irreversible and were therefore not affected by nephrectomy. (ii) The opposite and presumably normal kidney was already affected, but failed to manifest clinical changes by the usual laboratory procedures. (iii) The cause of the high blood pressure may not have been renal, that is, the condition was primary or essential hypertension.

### Fractured Pelvis with Rupture of Urethra and Bladder.

E. J. McCAGUE AND J. E. SEMANS (*The Journal of Urology*, July, 1944) comment on the high incidence of

urethral and vesical rupture complicating fractures of the pelvis in their highly industrialized area (Pittsburgh). Reduction of mortality and morbidity depends on five principles of treatment: (i) Early and accurate diagnosis should be established without refinements or instrumentation in order to avoid additional shock. (ii) Progressive shock causes most early fatalities, therefore immediate transfusion of blood and plasma should be given. (iii) Unless the bladder is perforated urinary extravasation occurs late. Catheterization alone is inadequate. Suprapubic drainage keep urine away from damaged tissues and a urethral catheter maintains continuity of the urethra. (iv) Rapid perineal drainage of the traumatized area with control of hemorrhage is carried out as soon as the patient's condition permits. If the rupture is intraperitoneal the peritoneal cavity must be drained as well as the bladder. (v) Immobilization of the pelvis is obtained by a firm binder and the pelvis is slung from a Balkan frame with the legs extended.

### Hypertension following Renal Operations.

W. G. HAYWARD (*The Journal of Urology*, May, 1944) believes that renal ischaemia may be produced by an aseptic perinephritis following conservative renal operations. He performed nephropexy with division of a large aberrant artery on account of nephroptosis with gastric and nervous symptoms. Three weeks later the patient complained of severe headache, and this was accompanied by a gross rise in systolic and diastolic blood pressure. Subsequently the patient had a subarachnoid hemorrhage. Although retrograde pyelography indicated correct anatomical structure, the result of the phenolphthalein test was poor on the affected side. At nephrectomy the vascular pedicle was found encased in dense fibrous tissue, although the perinephric fascia was not unduly adherent. It is pointed out that the frequent finding of dense adhesions which restrict any expansion of the renal capsule is common at secondary operations, but that condition does not produce hyperplasia.

### Congenital Renal Malformations.

T. ZONDEK (*British Journal of Urology*, June, 1944) states that since it is necessary, for the best performance of renal operations, to have a thorough knowledge of the shape and topography of these organs, it is wise to have some grasp of congenital malformations which may be encountered. He divides such malformations into five groups: Group I, the solitary kidney, (a) with one ureter, (b) with two ureters. Group II, hypoplasia of one kidney. Group III, the fused kidney, (a) unilateral with two ureters and (b) bilateral with two or more ureters. Group IV, bilateral non-fused kidneys with two ureters. Group V, the ectopic kidney. The solitary kidney is found on an average about once in 2,000 post-mortem examinations. The organ shows a diffuse compensatory hypertrophy. The uterine orifice on the affected side may be absent, or else two uterine orifices, on the same or different sides of the bladder, may be present. The hypoplastic type of kidney may be only a

non-functioning remnant, or else a half-sized "dwarf" type of kidney. Unilateral fused kidneys may form a broad, ovoid mass on one side or else be united end to end to form an elongated mass. The two ureters usually open into the bladder in the normal positions. To the group of bilateral fused kidneys belong the "horse-shoe" variety, one of the commonest of renal anomalies. The bridging isthmus joins the lower poles as a rule. In bilateral non-fused kidneys with two ureters, the latter reduplication may occur on one or both sides. If the reduplication goes all the way down into the bladder, two ureteric orifices will be seen at cystoscopy on one or even both sides. The ureter from the upper part of the kidney always opens below the other ureter into the bladder. If one portion of the kidney is unhealthy, it may be resected, the healthy portion being left intact together with its own blood supply. This is of especial value when the functioning power of the opposite kidney is at all affected. The ectopic kidney usually lies in the iliac fossa or even in the true pelvis. The hilum and pelvis and ureter are generally found on the anterior and upper portion of the organ, and the blood supply is found coming from the bifurcation of the aorta or the common iliac arteries. The condition probably arises in early fetal development from some hindrance to the normal ascent of the organ.

### Stress Incontinence in the Female.

F. MACKY (*The Journal of Urology*, July, 1944) publishes an original operation for stress incontinence in the female. The cause is usually an injury during labour, but the onset may be delayed for months, or even years, after the last confinement. The essential lesion is dysfunction of the internal (autonomic) bladder sphincter, with or without dysfunction of the external (voluntary) sphincter. Cases occur in all grades from minor loss to complete incontinence, and the author's operation is suitable for all forms. The operation is a suprapubic transvesical one, the method of approach being that of Harris for suprapubic prostatectomy. Closure of the bladder is around a de Pezzer tube and is also effected by the Harris technique. When the bladder is opened, inspection by means of an illuminated bladder retractor discloses an internal sphincter which is lax and atonic along the floor of the meatus. Sometimes one can even see some distance down the urethra. The object of the operation is to repair this torn sphincter without interfering with the action of the apex of the trigonal muscle which normally runs through the tonic sphincter to be inserted into the floor of the urethra. This object is achieved by making the sphincter repair a subtrigonal one by means of dissecting up the apical half of the trigonal muscle through incisions made along each of its sides. A little dissection on each side discloses the remains of the internal sphincter muscle, which is caught up with a mattress suture of number 3 plain catgut on each side and tied under the trigone. The normal ridge reappears, and the bladder outlet now looks and feels normal. The bladder is drained for three weeks.



## British Medical Association News.

### SCIENTIFIC.

A MEETING of the Queensland Branch of the British Medical Association was held on July 7, 1944, at the Mater Misericordiae Public Hospital, South Brisbane. The meeting took the form of a series of clinical demonstrations by members of the staffs of the Mater Misericordiae Public Hospital and the Mater Misericordiae Children's Hospital. Parts of this report were published in the issues of November 4, November 18 and December 2, 1944.

#### Cirrhosis of the Liver.

Dr. P. A. EARNSHAW showed a female child, aged three and a half years, whom he had first examined in March, 1943, when she was aged two years and three months. She had previously vomited blood on three occasions. Her appetite was poor, and she had several loose motions per day. She had had a troublesome cough for three or four days. The child had lived in New Guinea and had suffered from malaria. Another child, aged thirteen years, was alive and well. Five years before the patient's birth the mother had had a miscarriage.

On examination, the sclerotics were seen to be yellow. The liver edge could be palpated two fingers' breadth below the costal margin, and the liver was firm and "sharp"; the spleen was palpable. A basal systolic murmur was present, but no cardiac enlargement was detected. The child's temperature was 101° F. and her weight was 22 pounds. The fever, cough, diarrhoea and jaundice soon disappeared. A blood examination gave the following information: the erythrocytes numbered 3,900,000 and the leucocytes 7,500 per cubic millimetre; the haemoglobin value was 70% and the colour index 0.8. Of the leucocytes, 53% were neutrophil cells, 42% were lymphocytes and 5% were eosinophil cells. The platelets numbered 425,000 per cubic millimetre. Some anisocytosis and polychromasia was present. Punctate basophilia was present in an occasional cell. Reticulocytes were present in the proportion of 2.5%. The Van den Bergh test produced a faint indirect reaction; the fragility test produced normal results; the Wassermann test failed to produce a reaction. No malarial parasites were seen.

Dr. Earnshaw said that in the establishment of a diagnosis, a number of conditions were considered. Malaria was excluded, because no bouts of fever occurred, no malarial parasites were found, and no great increase was observed in the proportion of reticulocytes. Syphilis was ruled out because the Wassermann test repeatedly failed to produce a reaction and there were no other signs of syphilis. Aleuclhaemic leucemia was excluded because no immature leucocytes were found on repeated examination of the blood; moreover, the patient's subsequent history was against this condition. Thrombocytopenia was considered, but the platelet count was high. The possibility of spherocytic acholuric jaundice was entertained; but the fragility test gave normal results, the reticulocyte count was low and no crises of deglobinization occurred. The possibility of Gaucher's disease was considered; but the spleen was rather small, and the typical yellow, wedge-shaped thickening of the conjunctivae on both sides of the cornea was absent. Niemann's splenomegaly was excluded, because the child was not Jewish, and was too old for such a diagnosis. Dr. Earnshaw said that in considering the possibility of Gaucher's disease and Niemann's splenomegaly he had not considered it necessary to perform a splenic puncture, as there was so little supporting evidence. With regard to Hodgkin's disease, no lymph gland enlargement was apparent, and none of the characteristic bouts of fever occurred; the subsequent history was against such a diagnosis. Dr. Earnshaw came to the conclusion that the child was suffering from Banti's syndrome; his diagnosis was based on the enlarged spleen associated with a cirrhotic liver and a blood picture characterized by anaemia and leucopenia and complicated by haematemesis.

Dr. Earnshaw went on to say that McNee and McMichael considered that, as the histology of the spleen was the same whether hepatic cirrhosis was present or not, there was a strong possibility that the factors producing the splenomegaly were identical in all cases, and the great frequency of hepatic damage suggested that the morbid changes in the spleen were secondary to hepatitis. When hepatitis was not obvious even after histological examination, it was possible that it might have existed previously, but had undergone complete healing. Dr. Earnshaw therefore felt it safe to say that this child was suffering from Banti's syndrome

following upon hepatic cirrhosis, which had been demonstrated. Banti described two conditions—namely, a syndrome and a particular disease causing it. His clinical syndrome was the association of enlargement of the spleen, secondary anaemia and cirrhosis of the liver with its consequent manifestations. The particular disease which he described as Banti's disease was one characterized by a peculiar and unique splenic histology and by a characteristic course and clinical picture. Although it was well known in Italy, the Balkans and Egypt, it was never seen in northern European races.

It was not long before the child had further attacks of haematemesis, some of them being very severe, and as time went on they became more frequent. In these attacks the child felt very ill, became exceedingly pale, and after an hour or longer vomited a large quantity of blood. These attacks necessitated blood transfusions, sometimes as often as twice a week. During one period of three weeks, six blood transfusions were necessary. During the period of six months (twenty-six weeks) ending in February, 1944, she had seventeen blood transfusions, and the time was rapidly approaching when all available superficial veins would be used up. It was therefore necessary to decide on some course of action to prevent the haemorrhages if this was possible.

Dr. Earnshaw said that successful splenectomy did not prevent the occurrence and especially the recurrence of haematemesis. Moreover, in connexion with splenectomy: (a) the view that the splenic changes preceded the lesion in the liver was doubted; (b) successful splenectomy did not cure the anaemia, but on the other hand, the anaemia was still amenable to iron treatment after the operation; (c) the endophlebitic changes often found in the wall of the splenic and portal vein must, if present, increase the tendency to intraabdominal thrombosis; (d) the chronicity of the disease made it difficult to dogmatize on the curative value of splenectomy. The idea of splenectomy had therefore been abandoned, temporarily at any rate. The haematemesis was the result of haemorrhage by diapedesis, erosion or rupture of gastric or oesophageal varices. The portal system carried venous blood from the alimentary tract. The veins from the foregut found their way mostly into the splenic vein, but some also directly into the portal vein. The blood from the midgut was carried away by the superior mesenteric vein which joined with the splenic vein to form the portal vein, while the inferior mesenteric vein carried blood from the hindgut to the splenic vein. The portal vein divided into the right and left portal veins, and these in turn divided into numerous branches in the liver. The blood was carried from the liver by the right and left hepatic veins. That was the so-called portal circulation, and the only connexion it had with the systemic circulation was by the oesophageal veins, which anastomosed with the azygos and intercostal veins through the oesophageal plexus, and also by the rectal veins in the lower rectal and anal regions. There were also the tiny umbilical veins that accompanied the *ligamentum teres*; they anastomosed with the systemic vessels about the umbilicus. This explained why in cirrhosis of the liver and Banti's syndrome varicose veins formed in the cardiac and lower oesophageal regions of the alimentary tract causing haematemesis, and why they formed in the anal region causing haemorrhoids and also about the umbilicus causing the *caput medusae*.

The patient under discussion had haematemesis. She also had enlarged veins in the anal region; but no enlarged veins about the umbilicus were visible. The direct cause of the varices giving rise to the haematemesis might be (i) fibrosis of the splenic arterial radicles and the splenic pulp, whereby blood was shunted through the short gastric arteries, or (ii) obstruction in the portal circulation and dilatation of the short gastric veins.

Dr. Earnshaw said that he had therefore approached Dr. H. J. Windsor, the honorary surgeon at the Mater Misericordiae Children's Hospital, and asked him to perform a laparotomy and endeavour to ligate the *vasa brevia* and coronary vein with a view to diminishing the blood supply to the oesophageal varices. The operation was performed in February, 1944. At the same time, in order to improve the collateral circulation, an omentopexy was performed. The omentum was delivered into the upper portion of the rectal sheath and there fixed, in order to establish a collateral circulation with the veins of the upper abdominal wall, so that blood would be eventually carried away by the internal mammary and intercostal veins. That the operation had been successful could be judged by the fact that the child had had no more attacks of haematemesis in the six months since the operation, and also by seeing the leish of veins which had formed in the upper abdominal wall, the obvious



result of the omentopexy. The child was happy and contented and looked a normal child, instead of the pale, nervous and debilitated child she had previously been. During the operation Dr. Windsor had examined the liver and found it to be the typical, hard, nodular liver of cirrhosis, such as was found in adults.

Dr. Earnshaw had endeavoured to determine the cause of the cirrhosis in one so young. The mother said that the child had been in the Hospital for Sick Children, Brisbane, so Dr. Earnshaw wrote to the hospital authorities and was informed that, when she was one year and eight months old, the child was admitted, having vomited a quarter of a cupful of blood. Occult blood was found in the stools. She was discharged four days later. The liver and spleen were said to be enlarged. The Van den Bergh test produced no reaction. The red blood cells numbered 3,800,000, the white blood cells 9,900 per cubic millimetre, and the haemoglobin value was 72%. The platelets were normal. A few nucleated red cells were seen. No malarial parasites were found, and the Wassermann test produced no reaction. The condition of Banti's syndrome must therefore have been well developed by the time the child was one year and eight months old, so it would be safe to presume that the cirrhosis of the liver was present much earlier. There was no history of alcoholism, syphilis, or catarrhal or simple jaundice, and no history of treatment with arsenic or carbon tetrachloride. The family had never lived in India, where there was prevalent a special form of infantile cirrhosis, the cause of which was unknown. In the Malay States and the East Indies a form of cirrhosis was commonly met with in children and adults, which was caused by a colouring agent used in butter. Dr. Duhig stated that this agent was an aniline dye known as butter yellow. However, in the part of New Guinea where this family lived, the butter was imported from Australia. In tropical countries another common cause of hepatolienal cirrhosis was schistosomiasis. Dr. Earnshaw understood that some cases had been reported amongst American troops in the Solomons. However, as the infecting agent was the variety known as *japonicum*, it was more likely that the disease was contracted from the enemy than from the natives, as it was prevalent in Japan. Dr. C. C. Minty, of the Commonwealth Department of Repatriation, Brisbane, had said that so far he had seen no cases in repatriated soldiers who had served in New Guinea. Schistosomiasis therefore seemed unlikely to be the cause of the disorder in the case under discussion.

Dr. Earnshaw drew attention to the fact that with regard to the family history, he had mentioned that this child was jaundiced within twenty-four hours of birth. Neonatal jaundice might be divided into four groups: (i) physiological, (ii) obstructive, (iii) infective and (iv) haemolytic. In physiological jaundice, the jaundice generally did not appear till the third or fourth day. Obstructive jaundice, due to congenital absence or obliteration of the bile ducts, did not appear usually till the baby was a week or more old, and eventually caused the baby's death. The infective type might be due to syphilis or to umbilical sepsis; but in the present case the Wassermann test had persistently failed to produce a reaction, and no umbilical sepsis was present. Finally there was haemolytic jaundice, the commonest cause being a form of acute haemolytic anaemia known as *icterus gravis neonatorum*, in which the jaundice usually appeared within twenty-four hours of birth. The jaundice rapidly became intense. Later, as haemolysis took place, the skin assumed a waxy yellow appearance and the baby died in one to three weeks unless given blood transfusions, though in milder cases the babies occasionally survived without treatment. About ten years earlier it had been found that such cases of acute haemolytic anaemia were generally familial; in the majority of cases the first child was normal and all other children developed this condition. In this child's family, the first child was normal. Then there followed a miscarriage and next the patient. Dr. Earnshaw therefore regarded this child as one of those rare subjects of acute haemolytic anaemia of infancy that had managed to survive without treatment.

Dr. Earnshaw went on to say that in 1940 Landsteiner and Wiener had discovered that the red cells of 87% of the white race contained a factor which was also present in the blood of Rhesus monkeys. It was called the Rh factor, and the cells so affected were said to be "Rh-positive". It had recently been discovered that this factor also existed in the tissue fluids. Acute haemolytic anaemia was then investigated to see if there was any connexion between it and the Rh factor, and soon the cause of the malady was determined. It was discovered that when the husband's red blood cells and tissue fluids were "Rh-positive" and the mother's "Rh-negative", the offspring's red cells were generally "Rh-

positive", as the Rh factor was dominant. It was then postulated that the "Rh-positive" factor of the fetus crossed the placental barrier of the fetus and so set up anti-Rh bodies in the mother's plasma, so that the mother's blood contained Rh-negative red cells and anti-Rh-positive plasma. With each future pregnancy this anti-Rh factor in the mother's plasma was increased, and this plasma passed back from the mother's blood across the placenta and so haemolysed the "Rh-positive" red cells of the fetus, causing acute haemolytic anaemia. In 1812 Kinnear Wilson had described a familial condition to which his name was affixed, in which there was an association of cirrhosis of the liver and degeneration of the lenticular nuclei of the brain with consequent nervous symptoms such as tremor, rigidity *et cetera*. About ten years prior to the meeting it had been suggested that this and other conditions were apt to follow acute haemolytic anaemia of infancy. Thinking that there might be an association in this case, Dr. Earnshaw had the mother's blood and the patient's blood tested. The mother's red cells were "Rh-negative" and the patient's "Rh-positive". Therefore Dr. Earnshaw thought that there was no reasonable doubt that this child's haematemesis, which had now been controlled, was a part of Banti's syndrome following on cirrhosis of the liver due to acute haemolytic anaemia of the newborn, the result of the union of an "Rh-positive" father and "Rh-negative" mother.

#### Mediastinal Tumour.

Dr. Earnshaw's second patient was a boy, aged six years, who had been admitted to a country hospital on June 5, 1944, on account of tonsillitis and enlarged upper cervical lymph glands. The child's condition improved, though some difficulty in breathing persisted. This was thought to be due to the enlarged tonsils and adenoids. After he had spent a few days in hospital, the parents insisted on taking the child home against medical advice. Not many hours later he was brought back to the hospital on account of increased difficulty in breathing. The dyspnoea was worse at night. There was little trouble during the day. On the morning of June 14 he was given 20,000 units of diphtheria antitoxin in view of the possibility of laryngeal diphtheria. Later in the day, an X-ray picture taken of the chest revealed a large mediastinal tumour. The child was then transferred to the Mater Misericordiae Children's Hospital.

Dr. Earnshaw said that the family history was interesting. Another child had died after an appendiceal operation; an enlarged thymus was discovered at autopsy. A third child had died from what was thought to be diphtheria or pneumonia. A fourth child had died from double pneumonia at the age of eleven months. Three months prior to the meeting the mother had given birth to a stillborn child. Two other children were alive and well.

On his admission to the hospital the child was pale, and considerable enlargement of the right and left upper cervical lymph glands was present. He breathed through his mouth, and his breath was offensive. The tonsils were grossly enlarged; they almost met in the mid-line. Both nostrils were filled with a copious purulent nasal discharge. There was an area of dullness to percussion in the mediastinal region extending to two and a half fingers' breadth to the right of the sternum and to a somewhat shorter distance to the left. There were no cardiac murmurs. The apex beat was not displaced. The abdomen appeared to be normal. The temperature, pulse rate and respiration rate were normal. A blood count gave the following information. The red blood cells numbered 4,600,000 per cubic millimetre, the white blood cells numbered 9,200 per cubic millimetre, the haemoglobin value was 90%, and the colour index was 0.9. Of the leucocytes, 72% were neutrophilic cells and 28% were lymphocytes. The platelets were normal. The red cells were fairly normal. The Wassermann test failed to produce a reaction. The Mantoux test gave the following results: old tuberculin diluted one in 100 gave a slightly positive reaction; diluted one in 1,000 or one in 10,000 it produced no reaction. X-ray pictures revealed a large, dense shadow in the centre of the chest. Pulsation was seen in the lower portion of the left border of the shadow and none in the right border of the shadow. The diaphragm moved normally on each side. An X-ray picture after a "barium bolus" revealed no displacement of the oesophagus in any direction. Lateral and oblique views showed that only the anterior portion of the mediastinum was involved. X-ray pictures revealed both antra to be opaque. Microscopic examination of the urine revealed occasional hyaline casts and a few pus cells.

Dr. Earnshaw said that the diagnosis appeared to lie between (i) lymphadenoma, (ii) an enlarged thymus and (iii) lymphosarcoma. Against lymphadenoma was the fact

that the spleen was not palpable, nor had any of the characteristic bouts of fever occurred. Enlarged glands were present in the neck; but it was rarely that the upper cervical lymph glands were involved in lymphadenoma before the lower cervical lymph glands. Furthermore, the infected tonsils could account for the enlarged glands. In favour of an enlarged thymus was the fact that the dyspnoea was not always present, and at times the child was comfortable for several days together. The dyspnoea was worse at night. There was also the associated tonsil infection. In addition the family history was in favour of such a diagnosis. Against the diagnosis was the rarity of enlargement of the thymus and the doubt in many quarters of the existence of such a condition, and the fact that the X-ray pictures revealed no compression of the trachea. The great size of the tumour also had to be considered, although Dr. Earnshaw had seen in a subject who had died suddenly and who later came to autopsy, a thymus almost the size of the left lung. In favour of a diagnosis of lymphosarcoma was the size of the tumour, and also the fact that lymphosarcoma was one of the more frequent causes of such tumours. Against it was the absence of changes in the lung and the fact that the tumour did not involve glands in the posterior hilar regions.

Three weeks after his admission to hospital the patient's condition became worse. Respiration was more difficult, glands were palpable in both axillae and masses could be felt in the abdomen on both sides of the spine. There were moist sounds in both lungs. Dr. Windsor excised a cervical lymph gland for examination; the microscopic appearances were characteristic of lymphosarcoma. Deep X-ray therapy was given without benefit.

The next patient shown by Dr. Earnshaw was a boy, aged six months. He had been well till the age of three months, when he developed a slight cold and later a rattle in the chest. Still later he had a distressing cough, which was worse during the night. Dr. Earnshaw first examined the boy on May 2, 1944, when he was four months old. He was pale and his haemoglobin value was 75%. Both inspiration and expiration were embarrassed. Coarse moist sounds were present throughout both lungs. The adenoids were considerably enlarged. Neither the Mantoux test nor the Wassermann test produced a reaction.

X-ray pictures of the thorax were taken by Dr. V. McDowall. A fluoroscopic examination revealed that the heart and aorta were displaced to the left; both domes moved evenly, but with slightly restricted range. From the films it was seen that both lungs were moderately aerated, the heart was displaced to the left, the aorta was displaced to the left, and a tumour mass was present in the upper right portion of the mediastinum, corresponding roughly in position with an enlarged thymus. Dr. R. Graham Brown made a bronchoscopic examination, but found no abnormality.

Dr. Earnshaw said that the differential diagnosis was similar to that in the previous case, but enlargement of the thymus seemed the most likely condition. Deep X-ray therapy was given. A fortnight later an improvement seemed obvious. At the time of the meeting the parents thought that the boy's condition had improved, though Dr. Earnshaw could recognize no change. A recent blood count had given the following information: the total red blood cells numbered 4,200,000 per cubic millimetre, the haemoglobin value was 80%, and the colour index was 0.9. The total white blood cells numbered 14,000 per cubic millimetre. The proportion of lymphocytes was very high. Slight polychromasia was present. The platelets were normal. No enlarged superficial lymph glands were present which could be excised. The child was to have a further course of deep X-ray therapy.

#### Fracture of the Shaft of the Femur.

DR. A. V. MEEHAN showed two patients suffering from fracture of the shaft of the femur; both were aged about forty years. The first, a male patient, had a simple fracture at the junction of the middle and upper thirds of the shaft with great inward displacement of the lower fragment and about one inch overlap of the fragments. The patient was treated by weight extension on a Thomas's splint with the knee bent at an angle of 20°. The weight was attached to a Kirschner wire passed through the head of the tibia. Outward bowing was corrected by application of gutter coaptation splints of aluminium. A large compressed cotton wool pad was applied over the point of fracture on the outer side under the coaptation splint, and two similar pads were applied, one at the upper and one at the lower end of the internal coaptation splint. The bowing was gradually corrected by tightening the bandages controlling the coapta-

tion splints as the swelling of the limb subsided. After a few days the extension overcame the overlap of the fragments, and the weight was then reduced to ten pounds. X-ray examination showed that overlap had again developed after a few days. A weight of twenty pounds was again applied and left on until callus commenced to form three weeks after the fracture. The weight was again reduced to ten pounds, and at the time of the meeting, five weeks after the accident, inspection of the fragments showed 80% end-to-end apposition and excellent alignment. Dr. Meehan said that it was proposed gradually to reduce the extension. A weekly X-ray examination was made and would be continued till bony union was firm.

Dr. Meehan's second patient, a woman in the early forties, had sustained a badly comminuted fracture in the upper third of the femur as a result of being knocked down by a motor-truck. The upper fragment was flexed and abducted. A large intermediate fragment was present. The patient was treated in a bent Thomas's splint, and skeletal traction was applied through the head of the tibia commencing with a weight of twenty-five pounds for the first week. This was reduced to ten pounds. Flexion and abduction at the hip joint were maintained. Perfect apposition and alignment were not secured. Satisfactory callus failed to form, and after about twelve weeks a plaster cast was applied from about nipple level to beyond the toes. At a later stage the patient was allowed to walk in the cast with the aid of a walking stirrup and crutches. After about twelve months it was found that non-union was present.

Dr. Meehan said that a massive lay-on bone graft had been applied about six weeks before the date of the meeting and a fresh plaster cast was applied. He pointed out that he had always found the femur a kind bone as far as the achievement of bony union was concerned, and he had seldom been called upon to graft for fracture of the femur. In this case, however, violence had been great and the patient was of frail build; the large intermediate fragment present had interfered with accurate reduction and apparently with osteogenesis.

In the subsequent discussion in answer to questions, Dr. Meehan said that he had frequently used the Hamilton Russell method in the treatment of fracture of the femur in children, with satisfactory results; but it demanded constant supervision and a carefully trained staff. In adults he had not used this method to any extent, as he felt that in muscular subjects it was difficult to achieve and maintain full length of the femur by this method. He thought, however, that the method was most useful, and it had the remarkable advantage that no complicated apparatus was required. A fracture of the femur could be treated by this method under primitive surgical conditions with the aid of a few saplings and pulleys, a pillow and a length of cord. Good alignment, and in children full length, could be secured, provided constant supervision was exercised by the surgeon.

With regard to the use of ice-tong callipers for skeletal traction in the supracondylar region, Dr. Meehan said that in using this method for several years he had seen no really serious ill-effects; but in a number of cases the appearance of moisture at the point of insertion of the callipers had always made him anxious to remove the callipers and resort to adhesive plaster skin traction after three weeks. Such mild infection, if prolonged, led to scarring in and around the quadriceps muscle and was apt to interfere with knee movement later.

Discussing skeletal traction generally, Dr. Meehan described it as a most potent and therefore dangerous method of reducing overlap. He advocated strongly that it should never be used except under the supervision of an experienced surgeon, and condemned the use of the method except under conditions where adequate facilities were available for constant X-ray check. The real risk was overpulling of the fracture, leading to a gap between the fragments, with resultant non-union. A distraction of the fragments, which could not be appreciated by use of the tape measure alone, might easily be sufficient to lead to non-union. Subject to these limitations skeletal traction was, he thought, an advance in the treatment of fracture of the femur. Kirschner wire had the supreme advantage that its insertion through the bone led to much less trauma and therefore less risk of infection than the Steinmann pin. With regard to the site of insertion of the wire, Dr. Meehan said that he favoured the head of the tibia, in spite of the risk of damage to the ligaments of the knee joint by excessive pull. This could be avoided by reducing the weight to a minimum as soon as it had achieved its objective of securing end-to-end apposition and good alignment of the fragments. In his experience the disadvantage of the use of Kirschner wire in the supracondylar region of the femur was that the wire



was more apt to "travel" than in the head of the tibia, and was also apt to lead to the formation of scar tissue in relation to the quadriceps. This occurrence interfered later with good flexion movement at the knee joint.

#### Nephroptosis.

DR. G. S. C. HAYES discussed nephroptosis. He said that dropped kidney—a kidney which had fallen below the normal level—occurred relatively frequently in females (about 20%), but in males in only 1% or 2%. It was also much more frequent on the right side than on the left. The normal kidney lay somewhere between two horizontal lines, one passing through the body of the eleventh thoracic vertebra and the other through the body of the third lumbar vertebra; the right kidney lay a little lower than the left. A certain range of movement of the kidneys was normal, from two to five centimetres with respiration and about one centimetre in rising from the horizontal to the upright position. Normally also in females the kidney was about half a vertebra lower than in males. When movement of position outside this normal range occurred, nephroptosis was present. The main factors retaining the kidneys in the renal fossa were (i) the shape of the fossa (deep and pear-shaped, narrow below in males, shallow and cylindrical in females); (ii) trabeculae from the true capsule to Gerota's fascia; (iii) tonicity of abdominal muscles; (iv) the support of the renal pedicle. The fact that ptosis was much more frequent in females suggested that the shape of the fossa was the most important factor, as in the upright position the kidney could slip down the cylindrical fossa of the female if the other factors were not well developed. The pear-shaped fossa, narrow below, in males largely prevented this occurrence. In the radiological diagnosis of ptosis it was most important to take films with the patient in both the horizontal and upright positions. Three degrees of ptosis were usually described: (i) a kidney more than half of which was palpable on inspiration; (ii) a kidney the upper pole of which could be felt on inspiration and retained during expiration; (iii) the so-called floating kidney, which could be felt at any stage freely movable in the abdomen.

Dr. Hayes went on to say that in the X-ray investigation of ptosis a film was first taken with the patient in the horizontal position to determine the level of the kidneys in that position. The table was then tilted to the upright position, the sodium iodide was injected into the pelvis and the catheters were withdrawn so that the ureters were outlined. This exposure showed (i) the degree of ptosis in the vertical position as compared with the horizontal, (ii) the presence of kinks in the ureter, torsion *et cetera*, and (iii) clubbing of calyces *et cetera*, indicative of abnormality. The catheters having been completely withdrawn, the patient was told to stand and walk about for ten minutes, and then a third film was taken when he was in the upright position and the presence of any residual sodium iodide was noted. Normally, if drainage was not interfered with by the ptosis, all the contrast media should have found its way into the bladder. It should be noted that apparent kinks might be suggested in the upper part of the ureter owing to the fact that the portion within Gerota's capsule was loosely held in the perirenal fat, whereas below this it became firmly fixed to the peritoneum. During the normal downward excursion of the kidney on inspiration this upper portion became redundant and might suggest a kink. Whether or not the patient had symptoms or abnormality sufficient to warrant nephropexy or less radical measures, it was pointed out that the true significance of the ptosis in relation to symptoms sometimes apparently unrelated could not be adequately determined without investigation on the lines suggested. This was Dr. Hayes's routine, and also, unless there was any rare contraindication, bilateral pyelograms were made at the one sitting. With aseptic care and gentleness patients were little disturbed, and the saving in time by investigating both sides simultaneously was worth while.

A series of films was then shown to illustrate the points mentioned.

#### NOTICE.

THE General Secretary of the Federal Council of the British Medical Association in Australia has announced that the following medical practitioner has been released from full-time duty with His Majesty's Forces and has resumed civil practice as from the date mentioned:

Dr. A. H. Green, 84, Maribyrnong Road, Moonee Ponds, Victoria (January 1, 1944).

## National Emergency Measures.

### THE SUPPLY OF FLY WIRE GAUZE.

THE following statement and letter relating to the supply of fly wire gauze are published at the request of the Medical Secretary of the Victorian Branch of the British Medical Association.

Following inquiries forwarded to the Commonwealth authorities regarding the conditions under which fly wire gauze might be supplied to members of the public, and the circumstances governing the distribution of fly wire which require production of medical certificates, and, also, inquiring under what statute or regulations such certificates are demanded, the following letter has been received:

Commonwealth of Australia,  
Directorate of Materials Supply,  
Ministry of Munitions,  
Shell Corner,  
532 Bourke Street,  
Melbourne, C.I.

Medical Secretary,  
British Medical Association,  
Medical Society Hall,  
426 Albert Street,  
East Melbourne, C.2.

#### FLY WIRE GAUZE.

Dear Sir,

I refer to your letter of 12th October, 1944, relative to the supply of fly wire gauze which has been referred to this Directorate by the Department of Supply and Shipping.

At present the Service demands for fly wire gauze are very heavy, the main use being to provide protection against malarial infection in forward operational areas. Combined with this, production is restricted due to manpower shortage, and these conditions have made it impossible to provide for usual domestic requirements.

Limited quantities of fly wire gauze are released from time to time, mainly as a result of temporary delay in the receipt of Service orders due to some operational activity, and any saving of gauze is allotted to the undermentioned civil needs:

- (a) Protection of foodstuffs such as butchers' shops.
- (b) Repair and renewal of screens to hospitals.
- (c) To screen a sleepout where the inmate of the home is recommended to sleep out by a medical practitioner (such as a person suffering from T.B.).

To ensure that material available is directed to the purpose for which it is intended, the co-operation of health officers is needed in categories (a) and (b) to give a certificate of essentiality. However, a certificate from the local governing bodies health inspector is suitable for this purpose, if one is available.

With regard to category (c), it is desired that a doctor's certificate should accompany the application supporting the request for the release of fly wire gauze.

In view of the position set out above, you will appreciate that these certificates are required to ensure that the limited gauze available is delivered for the purposes laid down, and if the assistance of health inspectors or health officers and doctors attending privately to patients was not available it would be practically impossible to check the demands.

I shall be glad, therefore, if the co-operation of members of your Association should continue, and you may be assured that immediately it is possible to arrange sufficient supply of fly wire gauze to meet ordinary domestic needs, the condition of certification as to the justification of the application will be abolished.

Yours faithfully,

(Signed) H. C. GREEN,  
Director, Materials Supply.

## Post-Graduate Work.

### RESIDENTIAL COURSE IN OBSTETRICS.

THE New South Wales Post-Graduate Committee in Medicine announces that a residential course in obstetrics will be held at the Women's Hospital, Crown Street, Sydney, from January 1 to 6, 1945. The work of the course will be



supervised and will be of a practical nature. Patients will be allotted to post-graduates who will have the opportunity of following the patient throughout their stay. Demonstrations will be arranged in the sterility clinic. In addition to the clinical work, the following talks will be arranged:

*Monday, January 1.*

10.30 a.m.—Introduction and explanation of course: Dr. T. Dixon Hughes.

*Tuesday, January 2.*

10.30 a.m.—"The Use of Forceps": Dr. R. W. B. Stevenson.  
2.30 p.m.—"The Role of Blood Transfusion in Obstetrics": Dr. Ruth Heighway.

*Wednesday, January 3.*

10.30 a.m.—"Trial Labour": Dr. R. McD. Bowman.  
2.30 p.m.—"Puerperal Sepsis": Dr. J. Chesterman.

*Thursday, January 4.*

10.30 a.m.—"Toxæmia": Dr. H. McCredie.  
2.30 p.m.—"Induction of Labour": Dr. F. A. Bellingham.

*Friday, January 5.*

10.30 a.m.—"Ante-Natal Care": Dr. A. J. Gibson.  
2.30 p.m.—"The Rh Factor in Obstetrics": Dr. T. Dixon Hughes.

*Saturday, January 6.*

10.30 a.m.—"X Rays in Obstetrics": demonstration by the X-ray department.

The fee for the course, including board and residence, is £5 5s., and membership is limited to twelve.

A residential course in obstetrics will also be held at the Royal Hospital for Women, Paddington, from January 1 to 6, 1945. Throughout the course cases of interest in the hospital will be demonstrated, and out-patient clinics for both gynaecological and obstetric patients will be available.

*Monday, January 1.*

10 a.m.—Introduction to course.

*Tuesday, January 2.*

10 a.m.—"Puerperal Infection": Dr. T. H. Small.  
2 p.m.—"Toxæmia of Pregnancy": Dr. H. A. Ridler.

*Wednesday, January 3.*

10 a.m.—"Ante-Partum Hemorrhage": Dr. J. V. Mutton.  
2 p.m.—"Caesarean Section": Dr. Ida Saunders.

*Thursday, January 4.*

10 a.m.—"The Premature Baby": Dr. Kathleen Winning.  
2 p.m.—"Sterility in the Female": Dr. Bruce Hittmann.

*Friday, January 5.*

10 a.m.—Operative obstetrics.  
2 p.m.—"Ante-Natal Care": Dr. K. J. Howell.

*Saturday, January 6.*

10 a.m.—"Interesting Cases in Hospital": Dr. Bruce Williams.  
The fee for the course, including board and residence, is £5 5s., and membership is limited to eleven.

Applications for both courses, together with the amount of the fee, should be forwarded as soon as possible to the Secretary of the Committee, 131, Macquarie Street, Sydney. Telephone B 4606.

## Nominations and Elections.

THE undermentioned has applied for election as a member of the New South Wales Branch of the British Medical Association:

Mutton, Geoffrey Vernon, M.B., 1938 (Univ. Sydney), Major G. V. Mutton, 20, Reddall Street, Manly.

The undermentioned have been elected as members of the New South Wales Branch of the British Medical Association:

Alder, Ronald Milton, M.B., B.S., 1939 (Univ. Sydney), 1, Rose Bay Avenue, Bellevue Hill.

Bonnette, Stanley Albert, M.B., B.S., 1937 (Univ. Sydney), NX106995, Major S. A. Bonnette, 2 Australian Field Ambulance, Australia.

Hammond, Brian Thomas, M.B., B.S., 1941 (Univ. Sydney), 127, Belgrave Street, Kempsey.

Lewis, Louis Leonard, M.B., B.S., 1944 (Univ. Sydney), St. George District Hospital, Kogarah.

Robey, Lancelot Turbet, M.B., B.S., 1942 (Univ. Sydney), NX201399, Captain L. T. Robey, 1 Papuan Infantry Battalion, New Guinea.

Segal, Harry, M.B., B.S., 1942 (Univ. Sydney), Captain H. Segal, 9, Niblick Street, North Bondi.

Stuart, Mary Grace, M.B., B.S., 1944 (Univ. Sydney), 90, Bellevue Road, Bellevue Hill.

Verso, Murray Linton, M.B., B.S., 1940 (Univ. Sydney), Captain M. L. Verso, Headquarters, Northern Region, ANGAU.

## Books Received.

"We Were the Rats" by Lawson Glassop; 1944. Sydney: Angus and Robertson Limited. 8½" x 5½", pp. 288. Price: 9s. 6d.

"Front-Line Airline: The War Story of Qantas Empire Airways Limited", by E. Bennett-Bremner; 1944. Sydney: Angus and Robertson Limited. 8½" x 5½", pp. 193, with illustrations. Price: 12s. 6d.

"The Nature and Treatment of Mental Disorders", by Dom Thomas Verner Moore, O.S.B., Ph.D., M.D., with a foreword by Edward A. Strecker, M.D.; 1943. New York: Grune and Stratton. 8½" x 5½", pp. 319. Price: 28s.

## Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

**New South Wales Branch** (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phoenix Mutual Provident Society.

**Victorian Branch** (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

**Queensland Branch** (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL, or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

**South Australian Branch** (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

**Western Australian Branch** (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia.

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